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ABSTRACT

This master's thesis focuses on the relationship between children's development of communicative competence and patterns of communication between children and their primary caregivers. An overview of major changes, since the 1950s, in the theoretical and empirical approaches to language development is presented in Chapter II. Within this overview, changes in researchers' understanding of the relationship between children's language development and their interaction with primary caregivers are summarized. Methodological issues which constrain the validity of some conclusions and generalizations concerning children's language are identified, illustrated, and discussed in Chapter III. In Chapter IV earlier research on the structural characteristics of the primary caregivers is reinterpreted in the light of more recent data on the functions and patterns of communicative strategies used by primary caregivers in conversations with their young children. Studies on the interaction between mothers and their mentally handicapped children are discussed in Chapter V. Included in the discussion are methodological issues specific to the research with mentally handicapped children. The concluding chapter of the thesis discusses implications for future research on the development of communicative competence and implications for language training programs for mentally handicapped children. (Author/MP)

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COMMUNICATION PATTERNS BETWEEN MOTHERS AND PRESCHOOL-AGED CHILDREN

by

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Department of Educational Theory

A Thesis submitted in conformity with the requirements
for the Degree of Master of Arts in the
University of Toronto

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CHAPTER I

BACKGROUND PERSPECTIVES

Major differences exist between the prevalent theory and research trends in the field of language development of normal children and the approach to language development in mentally handicapped children. During the 1970's, in the field of normal language development, there was a swing away from the earlier focus on the products of the child's language development, that is, on the sequence of acquisition of grammatical rules and structures. Currently, there is an increasing emphasis in theory and research on the role of communication between the child and primary caregivers, on the role of the context of this communication and on the role of the child's cognitive processes, in the child's development of communicative competence. The term "communicative competence" was first used by Dell Hymes (1972) to refer to competence in the appropriate and effective use of language for different functions and for communicating with different people in different situations, as well as to competence in knowledge of linguistic rules. The field of language development may be more aptly named the field of communication development.

In contrast, in the field of mental handicap, the main focus of research remains on documenting the child's acquisition

of various linguistic rules and structures, and comparing the rate and sequence of acquisition with the language development of normal children of similar chronological age or mental age (e.g., see Cromer, 1974; Sitko & Semmel, 1973). The majority of language intervention programmes emphasize the teaching of syntax, using operant principles of behaviour modification, and take little account of the context of learning, or of the communication patterns between child and primary caregivers, in designing the programme. Several professionals in the field of mental handicap have recommended that language intervention programmes shift their focus from a sole concentration on teaching syntax to teaching communicative skills using the available data on the development of communicative skills in normal children (Berry & Marshall, 1978; Fristoe, 1977; Mahoney, 1975; Miller & Yoder, 1974; Yoder & Reichle, 1977). These recommendations have not yet been realized.

These differences most likely represent a time-lag between research findings and their application, since the field of mental handicap has rarely generated theories of its own, but has tended to take issues and ideas from other fields, comparing the performance of mentally handicapped individuals with that of normal individuals. This time-lag may well have been augmented by the complexity and the proliferation of literature on language development of normal children. Contributions from many different disciplines to the field of child language development have

resulted in the appearance in the literature of concepts and terminology from these different fields. The combination of a wide variety of terms, frequently not clearly defined, and the large numbers of studies in the 1970's, have rendered integration of the literature a major task in itself.

Before engaging in further research on language development in the field of mental handicap, it is time to examine these two fields of language development in order to derive the most relevant direction in research for gaining new insights into the language abilities of mentally handicapped children, and for increasing the efficacy of language intervention programmes. This thesis will focus on the relationship between children's development of communicative competence and patterns of communication between children and their primary caregivers. The two fields of language development, namely language development in normal children and in mentally handicapped children, will be examined from this perspective.

Observational studies of conversations of primary caregivers with their normal children who are just beginning to talk, or with their mentally handicapped children of similar language abilities, have been examined in depth and provide the data base for this thesis. This is not to negate the importance of experimental studies of child language, but rather is an attempt

to integrate the information from the growing body of observational studies of verbal interaction between primary caregivers and children.

An overview of major changes, since the 1950's, in the theoretical and empirical approaches to language development is presented in Chapter II. Within this overview, changes in researchers' understanding of the relationship between children's language development and their interaction with primary caregivers, are summarised.

During this synthesis of the literature, many methodological issues were identified which constrain the validity of some conclusions and generalisations which have previously been drawn from this strand of the literature on child language. These methodological issues are identified, illustrated and discussed in Chapter III. Issues which are particularly relevant to research in the field of mental handicap are discussed later (see Chapter V).

In Chapter IV, earlier research on the structural characteristics of the speech of the primary caregivers is re-interpreted in the light of more recent data on the functions and patterns of communicative strategies used by primary caregivers in conversations with their young children. Current understanding of the role played by primary caregivers in facilitating their children's development of communicative competence is discussed.

The major conclusions from the integration of the literature in this and the preceding chapters are recapitulated in the final section of this chapter, providing one perspective from which to view the development of communicative competence.

This perspective is then used in Chapter V to examine the approach to language development in the field of mental handicap. Consistent with the theme of the thesis, the chapter will focus on communication between primary caregivers and their mentally handicapped children.

The concluding chapter of the thesis discusses implications derived from this integration of the literature for future research on the development of communicative competence and for language training programmes for mentally handicapped children.

CHAPTER II

LANGUAGE DEVELOPMENT: THE SHIFT IN RESEARCH TO MOTHER-CHILD INTERACTION

Introduction

The rapid proliferation of studies on child language during the 1960's and 1970's has been accompanied by complex changes in the approach to language development, and hence in research design and analysis of data. For example, in the 1960's most language studies documented the syntactic complexity of children's speech at different ages (e.g., McNeill, 1966; Braine, 1963). Then, in the early 1970's, while one group of investigators focused on the cognitive bases of language development and on the child's development of meaning (e.g., Sinclair de Zwart, 1969; Brown, 1973; Bloom, 1970), others documented the syntactic complexity of maternal speech addressed to young children, seeking to correlate features of maternal speech with the child's language development (Broen, 1972; Phillips, 1973; Snow, 1972). During the late 1970's, there has been a shift in focus of research from descriptions of the speech of either the child or the mother to an examination of the verbal and non-verbal communication between the child and primary caregivers. These changes have not occurred at random, but have paralleled changes in the theories of the nature of language. Studies concerning the relationship between language development and the early language

environment provided by primary caregivers forms just one strand of the total literature on language development in children. In order to examine and understand the changes that have occurred during the 1970's in the literature on mother-child communication, it is necessary to place it in perspective, along with the literature on language and language development.

A brief examination of the history of linguistics reveals many different attempts to explain the nature of language. The complexity of the task has continually forced each researcher to focus on just one of the many aspects of language at any one time. The particular aspect emphasized in any one approach is determined mainly by the background assumptions held by the investigator concerning the nature of language. This, in turn, is largely determined by the assumed relationship between cognition and the social and linguistic domains of knowledge. Changes in theories concerning the nature of language may be demonstrated by presenting three models of language outlined by Cherry & Lewis (1977). These models will be described briefly, and then related to the major approaches to language and language development.

LANGUAGE MODELS

Cherry & Lewis (1977) outlined three models, the Reductionist, Interactionist and Unified Models, which describe the various relationships that have been postulated between the linguistic,

cognitive and social domains of human knowledge. These models may be used to demonstrate the changes in the theories of the nature of language, and in theories of the acquisition of language.

In the Reductionist Model, language, social and cognitive domains of knowledge are assumed to exist as separate domains and to develop independently of each other. Thus, language is conceived as an isolated domain of knowledge that is best described in terms of its structural components and in terms of the rule system for systematically combining and ordering these components.

The Interactionist Model also assumes that the three domains of knowledge are discrete, but postulates that there are unidirectional, causal relationships between them. A strong relationship is assumed between the cognitive and linguistic domains of knowledge, and theories of cognition are incorporated into theories of language. Language is either seen to be derived from cognitive knowledge, or conversely, to give rise to cognitive knowledge. Linguistic knowledge, therefore, must include knowledge of meaning or of the semantics, as well as knowledge of its structure. The majority of investigators assume that language derives from cognitive knowledge and postulate a strong relationship between cognitive knowledge and semantics.

In the Unified Model, all three domains of knowledge are assumed to be interrelated and interdependent. This model assumes that causal chains interrelate the three domains. Thus, an

individual's knowledge of language is interrelated with, and interdependent on cognitive and social knowledge. Language is perceived as a system of communication which necessitates integration of linguistic, cognitive and social knowledge, in order for the listener to interpret a message as the speaker intended.

MAJOR APPROACHES TO LANGUAGE DEVELOPMENT: AN OVERVIEW

A comprehensive review of the major theoretical approaches to language development, which have emerged since 1950, is beyond the scope of this thesis. An overview is presented in which the major approaches are related to the models described above, and in which the main limitations of these approaches will be summarised. The role of parental language in fostering language development in children is examined from these theoretical perspectives.

Verbal Learning Approaches

Behavioural psychologists were concerned primarily with the speech aspect of language performance. They viewed language as just another form of human behaviour that could be accounted for by the laws of conditioning. Skinner's (1957) analysis of language as a quantitatively changing collection of verbal behaviour, acquired and used in accordance with the principles of learning theory, falls within the Reductionist Model. Linguistic knowledge is thought to consist of a set of sentences, which are chains of

word associations learned in accordance with principles of learning theory, such as reinforcement and imitation. The relationship between word and word classes is described by conditional probabilities (Skinner, 1957). Thus, language is viewed as a number of discrete units of behaviours, independently learned, rather than as an integrated system of linguistic behaviour.

Skinner's theory has been modified and revised (for review, see Staats, 1974), for example, in the Social Learning Theory, as an imitation-based theory of language acquisition (Bandura & Harris, 1960; Miller & Dollard, 1941; Whitehurst & Vasta, 1975). The narrow concept of language as a set of learned skills, however, did not change.

This explanation of language development did not account for qualitative changes which occur in children's language, or for the unique utterances of children. Nor does this explanation accord with the fact that children do use rules in ordering and forming words, and that they overregularise the rules that they acquire. For example, young children may use the words "feet" and "went" correctly at first, but after learning the regular plural ending "s" and the past tense ending "ed", they may switch to saying "foots" and "goed". According to verbal learning theory, children would have been reinforced initially when they were saying the correct forms. The theory cannot account for why children replace these reinforced imitations with deviant forms

which they probably have never heard before.

This type of theory portrayed the child as mechanically responding to environmental stimuli that are provided initially by primary caregivers. Adult speech was assumed to serve as a model for the child and to provide positive reinforcement for successive approximation of the child's utterance to the adult standard. Adult speech addressed to children was not assumed to be modified in any way, or to possess any special structural or semantic characteristics.

Linguistic Approach

Linguists have attempted to formulate an abstract system of rules to describe the knowledge of an ideal speaker-listener about the language system itself. Chomsky (1957) rejected the stimulus-response concept of language and proposed that linguistic knowledge consists of knowledge of a finite set of rules for ordering and combining words to form an infinite set of sentences.

Chomsky proposed that a speaker's meaning is constructed in basic grammatical relationships like subjects or predicate objects, which form the "deep structures" of a sentence. These structures contain "phrase markers", like subject-noun phrases which are arranged in hierarchical relations. Through the use of a series of transformational operations or rules, the deep structure phrase markers are deleted, combined and recombined to form a linear arrangement of lexical items. This is the surface structure which

retains the meaning of the original deep structure, but is different in form. Surface structures, in turn, are transformed phonologically into strings of speech sounds. Later, Chomsky added a separate semantic component to his model which transforms syntactic structures into semantic entities like agent and action by the action of another set of lexical rules. These deep syntactic structures are the central element of language and are independent of cognitive-semantic knowledge (McNeill, 1970; Chomsky, 1957, 1965).

The transformational linguists proposed that this linguistic knowledge is innate, and develops rapidly in an orderly, pre-programmed sequence through the process of maturation, almost independent of environmental influence (Chomsky; 1957; Lenneberg, 1967; McNeill, 1966, 1970). This narrow focus on linguistic structure, with an almost total disregard for social and cognitive knowledge, is also consistent with the Reductionist Model.

Chomsky's work has had, and continues to have, a dramatic effect on research in child language development. Observational studies in the early 1960's focused on the sequence of emergence of transformations (e.g., passives, negatives, questions) and on the distribution and order of words (Braine, 1963; McNeill, 1966; Klima & Bellugi, 1966). Investigators tried to infer the grammatical structures and rules of children's early language combinations, hoping to link empirically the linguistic transformational grammar systems with children's acquisition of

language rules.

This model assumed that some exposure to adult language was necessary for language development, but adult speech was not assumed to play any role other than providing a data base against which the child could test his innately generated hypotheses. Adult speech was noted to be full of grammatical inconsistencies, false starts, hesitations and so on. Parental speech addressed to children was assumed to be likewise, and so would be an inadequate model for the child, supporting Chomsky's proposed innate language acquisition device, L.A.D. (Chomsky, 1957; McNeill, 1966).

This linguistic approach has proved insufficient for explaining the complex process of language development. A theory which attributes development to innate and preprogrammed factors cannot account for individual variation in development; a phenomenon which is widely recognized in language development (Bloom, Hood & Lightbown, 1974; Nelson, 1973; Lieven, 1978; Cross, 1977). The theory cannot account for the ambiguous forms in children's speech, and with a focus on the syntactic aspect of language, does not deal with the child's development of meaning or with the child's growing communicative skills.

Recent work has shown that the meaning of children's utterances cannot be determined from word order alone. Thus, the primacy of syntax is questioned. A group of investigators have also

challenged Chomsky's assumptions concerning the nature of adult speech, and examined the structural characteristics of speech addressed to children and adults (Snow, 1972; Drach, 1969; Broen, 1972; Phillips, 1973). Fodor (1966) commented as follows on these investigations:

> Research is now being carried out in an attempt to determine the precise character of the verbal environment of the child. Until the results of this research are known, however, it would be methodologically sound to assume that the child's increasing linguistic proficiency is not to be attributed to any significant extent to the special character of the utterances he hears. (P. 108.)

However, this research has, in fact, demonstrated that both the syntactic and semantic content of adult speech addressed to young children is greatly modified, suggesting that parental speech may, in fact, guide language development (Broen, 1972; Snow, 1972; Newport, 1976; Cross, 1977).

Cognitive Semantic Approach

In the late 1960's, several linguistic theorists (Fillmore, 1968; McCawley, 1968) became dissatisfied with the purely syntactic description of language, observing that, counter to Chomsky's

theory, transformations do often change the meaning. These "generative semanticists" (Fillmore, 1968; McCawley, 1968) proposed that meaning is not encoded into syntactic relationships like subject-verb in the deep structure of sentences, but is realized directly in speech through semantic-grammatical rules which state, for example, that agent precedes action. In Fillmore's (1968) "case" grammar, structure was viewed as inexplicably related to the meaning intended by a speaker. These semantic relationships were assumed to reflect the individual's perception and understanding of the relationships between entities and actions, that is, to reflect cognitive knowledge. Language was thought to "map" onto, or to encode, existing cognitive knowledge. Previous theorists had proposed the reverse relationship between language and cognition, i.e., that linguistic knowledge influences thought (e.g., Whorf, 1956). Both these conceptions of a direct relationship between the cognitive and linguistic knowledge, fall within the Interactionist Model.

At the time of the development of generative semantics, a combination of developments in the disciplines of theoretical linguistics, cognitive psychology, and development psycholinguistics resulted in a shift in the focus of studies from syntactic to semantic aspects of children's utterances. Bloom (1970) stressed the importance of examining the child's non-verbal behaviour and the context in which the child's language occurred, in order to

interpret the meaning of the child's utterances. Children were observed to apply different semantic functions to identical lexical entities, in different contexts. For example, the utterance "mummy" may refer to the mother as an agent, a possessor, or a possessed entity and so on, in different contexts (Bloom, 1970).

Bloom (1970) still working within a Chomskian framework, proposed that the addition of semantic information to generative transformational grammar would provide a more comprehensive account of a child's grammar. Schlesinger (1971) moved away from a syntactic analysis with the postulate that semantic relationships were encoded directly into semantic rules, and not into syntactic units as Bloom (1970) had proposed. This proposition that a child's grammar was semantic and not syntactic was a concept that was consonant with Fillmore's (1968) "case" grammar. When investigators applied the "case" grammars to an analysis of children's utterances, they found them to provide a relatively good description of children's grammars (Brown, 1973; Bloom, 1970; Bowerman, 1973; Greenfield & Smith, 1976). These cases were said to represent a universal set of concepts. Slobin (1973) and Bowerman (1973) demonstrated that children of many cultures expressed essentially the same semantic relations, and proposed that the developmental order of encoding semantic relations is linked to the developmental order of their underlying cognitive structures. Extensive research has proceeded to investigate the hypothesis that linguistic

development paralleled, and was dependent upon cognitive development (for reviews, see Bowerman, 1978; Cromer, 1976; Leonard, 1978). These studies all reflect the general trend toward analyzing development in a child's language in relation to the child's changing ways of perceiving and thinking about his experiences in the world. This trend is in marked contrast with the preceding one in which the analysis was based on an adult linguistic system.

The landmark of the change in focus from syntax and an adult linguistic system to semantics and a child-oriented perspective was Bloom's study in 1970. In the study, Bloom (1970) observed that the emerging grammars proposed for the three child-subjects were very different, and could not therefore be accounted for by Chomsky's model of an innately preprogrammed structure. Bloom (1970) proposed that:

> The difference among them must reflect the importance of individual differences in the interaction between cognitive function and experience, which could not be assumed to be the same for any two children. (P. 227.)

Thus, by implicating cognitive function with linguistic behaviour, Bloom's (1970, 1973) work not only terminated the era in which children's utterances were interpreted only in syntactic terms, independent of meaning, but also initiated the semantic-cognitive approach. Typically, the research of investigators such as

Bloom (1970), Bowerman (1973) and Brown (1973), has been categorized as a semantic approach. However, encoding of semantic relationships must reflect the perception and comprehension of certain relationships between entities and actions in the environment. This perception and comprehension must be considered as products of cognitive processes. From this viewpoint, the Semantic approach is intrinsically linked to the cognitive approach.

Within this cognitive-semantic approach, adult speech addressed to children was not assumed to possess any special characteristics, but the interaction between mother and child, and the child's non-verbal behaviour, were considered to be of major importance in determining the child's meaning. The cognitive-semantic approach emphasized the importance of the children's interaction with their physical environment (which may include people), but did not place any special emphasis either on their interaction with the social world, or on the nature of their linguistic environment.

During this period, a separate body of psychological studies, examining the influence of social class on cognitive development, found social class differences in maternal language addressed to children. The early linguistic environment provided by mothers was thought to influence children's cognitive and linguistic development (Hess & Shipman, 1965; Bee et al, 1969). The conclusions of these studies contrasted with Chomsky's assumption that the children's

increasing linguistic skills could not be attributed in any significant extent to the characteristics of their verbal environment. Then, additional studies challenged Chomsky's assumption directly by analyzing and describing distinct modifications of syntax in adult speech addressed to language-learning children (Broen, 1972; Drach, 1969; Phillips, 1973; Remick, 1976; Sachs, Brown & Salerno, 1972, Snow, 1972). These findings stimulated a plethora of interest in the structural characteristics of maternal speech. Many investigators sought to correlate syntactic and semantic features of maternal speech with the child's language development (Newport, 1976; Cross, 1977). The concentration in the majority of these studies on syntactic description of maternal speech was consistent with the emphasis on generative syntactic grammar in child language studies in the 1960's. But, for the first time, adult speech (more specifically, maternal speech) was assigned a central role in facilitating the development of language in children.

The cognitive-semantic approach, while providing rich insights into children's linguistic skills, has also proved to be limited in explaining language development. The work of the semanticists (Bloom, 1970; Bowerman, 1973; Slobin, 1973; Brown, 1973) redirected the focus of research from the structure to the content of children's utterances, resulting in extensive analyses of these utterances in terms of syntactic and semantic

structure. These semantic-syntactic grammar systems are descriptive of the child's products of language development, and do not necessarily explain the process of their acquisition. The linguistic and cognitive-semantic approaches are unilateral, in that they assume the structure or surface content of a speaker's utterance is dictated by the speaker's linguistic and/or cognitive knowledge of the referent. Language is more than a symbolic system for representing knowledge; it is also a system for communicating and sharing knowledge. In order to communicate about a specific referent to a listener, the speaker must take into account the listener's knowledge of it. Thus, the actual form of the spoken utterance is controlled by the speaker's anticipation of the listener's knowledge of the specific referent, as well as by the speaker's knowledge of the referent (Olson, 1970). The cognitive-semantic approach did not account for the forces exerted by communicative needs on the content and form of children's utterances.

Emerging Theoretical Framework: A Transactional Approach

Until the 1970's, linguists and psycholinguists had assumed that it was possible to account for all the meaning in the surface form of utterances by means of the systems used to describe the semantic or syntactic deep structure. The same sentence, however, with the same lexical items, may have different meanings on different occasions, depending on who utters the sentence, and

in what social and conversational context.

Linguistic knowledge had been defined in earlier theories as knowledge of linguistic structure, which means knowledge of the rules of phonology, of syntax, and of semantics. The knowledge ensures that the form of each sentence generated is structurally correct, and that the perceived relationships between entities are correctly expressed, but this knowledge will not ensure that the form of the sentence is appropriate to the specific social context. Several theorists have argued that linguistic knowledge must also include knowledge of the conventions of use of language which control the selection of well-formed utterances appropriate to a particular situation (Hymes, 1972; Cazden, 1972; Cicourel, 1972). Hymes (1972) termed this broader concept of linguistic knowledge "communicative competence". This term includes the:

> ...knowledge of sentences, not only as grammatical, but also as appropriate. He or she acquires competence as to when to speak, when not, and as to what to talk about with whom, when, where, in what manner. In short, a child becomes able to accomplish a repertoire of speech acts, to take part in speech events and to evaluate their accomplishment by others. (P. 277.)

The social and communicative aspect of language had been either ignored or de-emphasized in previous attempts to describe

the nature of language. The term "pragmatics" is used to refer to the linguistic realization of these social and communicative functions; that is, to the use of language in context. Philosophers, linguists, psycholinguists and sociologists have attempted to formalize the contextual information of utterances by developing taxonomies for describing the functions of language and the rules or conventions which govern its appropriate use (e.g., Austin, 1962; Gordon & Lakoff, 1975; Grice, 1975; Lakoff, 1973; Searle, 1969).

Two trends, which stem from the emphasis on the communicative aspect of language may be observed in the field of language development. There exists a substantial and growing body of research which describes children's use of language, ranging from descriptions of non-verbal communicative skills (Halliday, 1973; Antinucci & Parisi, 1973; Bruner, 1975; Bates, 1976) to early uses of verbal language (Dore, 1975; Ervin-Tripp, 1977; Greenfield & Smith, 1976; Keenan & Schieffelin, 1976). Several researchers have developed taxonomies for describing the communicative intentions of young children (Halliday, 1973, 1975; Dore, 1975; Bruner, 1975). The application of taxonomies of pragmatics to children's utterances is a descriptive approach in the same way as transformational grammar described syntax of children's utterances. Descriptions of the products of language development cannot be taken as explanations of the process by which the classified behaviours are developed.

The second trend in the field of child language development consists of attempts to explain the process of language development by analyzing the dynamics of the interaction between mother and child. Many investigations are underway concerning the relationship between children's development of communicative competence and the well-documented phenomenon of modified adult speech addressed to children (Bruner, 1975, 1978; Snow, 1977, 1978; Ninio & Bruner, 1978; Ervin-Tripp, 1978; Lieven, 1978). These studies are of central concern to this thesis, and will be discussed in a later section. There is growing consensus among these researchers that "language is learned only in the context of interactive dialogue" (Rees, 1978, p. 197). A child's development of communicative competence begins at birth by active participation in interaction with responsive primary caretakers, and with the physical environment (Bruner, 1975, 1978; Cherry, 1979; Halliday, 1975; Lieven, 1978; McLean & Snyder-McLean, 1978; Snow, 1977, 1978; Rees, 1978). Previous approaches to language development postulated a unilateral process. Learning theory had attributed the whole process to explicit teaching by adults, using principles of reinforcement and operant conditioning, with the child mechanically responding to the environmental stimulus. The generative linguistic approach had posited language development to be an innate process with "preprogrammed" structure that was "triggered off" at the appropriate time in the individual's maturational process, requiring only minimal exposure to adult language. The cognitive-semantic

approach had proposed that language was not acquired suddenly and rapidly at a specific point in development, but rather originated during the process of cognitive development, language being dependent on the acquisition of certain prerequisite cognitive structures. The child developed cognitive structures by interacting with the physical environment and by integrating the gathered information. It may be inferred that the process of language development is indirectly dependent on the child's interaction with the physical environment. During the mid-1970's, the locus of responsibility and the direction of causality for language development was shifted from the child and his interaction with the environment, to the primary caregiver (generally the mother). At the height of research on maternal speech, several investigators had sought to attribute language development to specific teaching by the mother (e.g., Moerk, 1974; Newport, 1976).

In contrast to these unilateral approaches, the transactional approach proposes that both child and primary caretaker play major roles in the process of development of communication. In view of the asymmetric relationship between primary caretaker and child in terms of the unequal distribution of cognitive, social and linguistic knowledge, the primary caretaker will exert a major influence on patterns of interaction with the child and hence on the child's development of communication (Harris, 1975). Adults, and especially the child's primary caretakers, facilitate this process

of development by segmenting and marking the components of an ongoing interaction (Bruner, 1978; Ninio & Bruner, 1978; Bridges, 1979; McLean & Snyder-McLean, 1978; Shugar, 1978) by modifying their verbal and non-verbal communication, in accordance with the child's communicative skills (Snow, 1977, 1978; Garnica, 1978; Newport, 1976; Cross, 1978) and by engaging the child in conversations, interpreting and responding appropriately to the child's communicative attempts (Cherry, 1979; Snow, 1978; Lieven, 1978; Tamir, 1979; Wells, 1979). The child actively participates in interaction with the physical and social environment, contributing and developing a set of interactive linguistic and cognitive strategies which enable the child to selectively attend to, process, respond to, and request the adult's facilitating strategies. The child's development of language, social and cognitive knowledge, is assumed to be a unified process in which these three domains of knowledge are interrelated and interdependent. Interaction with the social and physical environment is both context and source of development (Rees, 1978).

CHANGING RESEARCH STYLES AND STRATEGIES

This section reviews the changes in research styles and designs which have been used in observational studies of spontaneous conversations between young children and their mothers. The major research trends are summarised in Table I.

Child Language Studies

The earliest attempts to observe and record the linguistic development of children consisted of detailed daily descriptions of the development of individual children until they were about three years old (Tiedemann, 1787; Preyer, 1882; Sully, 1895; Sterns, 1928; Leopold, 1939-49). These diary studies were largely rejected as being unscientific by the strong behavioural trend in psychology in the 1960's. These descriptions, however, included accurate recording, not only of the form of the child's utterances, but also of the context in which they were made and of their suggested meanings. The diary studies were replaced by what were later called by Bloom (1975) "count" studies. These studies documented increases with age, in the number and kinds of words used and in the length of utterance. Cross-sectional designs were used to compare large numbers of children of varying age, sex, and background (e.g., Lenneberg, 1967). Study started when children began to utter recognizable words, that is, at about 12 months of age.

In the early 1960's, inspired by Chomsky's work, research became syntax oriented, and focused on the emergence of syntactic constituents (e.g., object, verb, etc) and of transformations (e.g., negatives, passives). Child research started at the point when children began to combine two or more words in a systematic way, that is, about 20-26 months. Research proceeded deductively. Numerous indices of syntax, derived from the adult linguistic system,

were applied to the surface structure of children's utterances in an attempt to demonstrate a particular theory. Their utterances were analyzed in isolation from the context in which they occurred. The most important research trend was the reintroduction of extensive longitudinal sampling of children's spontaneous speech (a refinement of the earlier diary studies), in contrast to cross-sectional studies. This approach enabled investigators to analyze changes and development in the language of individual children (e.g., Brown, Cazden & Bellugi, 1969).

In the late 1960's, the changing emphasis on the semantic aspects of language and the incorporation of cognitive theory of development necessitated the study of much younger children. Children from the age of about 10 to 12 months old were observed in order to investigate their first meaningful utterances and the relationship between these meanings and the child's level of cognitive development. The context and the children's ongoing behaviour, as well as the form of children's utterances, were examined in order to determine meaning. Investigators hoped to document the relationship between language and overall cognitive development and to discover a common order of emergence of the various semantic functions. Again, the regularities in development were stressed. Many investigators grouped the data from individual children, concluding that there were great similarities (e.g., Brown, 1973; Bloom, Lightbown & Hood, 1975). Recently, several

investigators, analyzing each child's development individually, have reported marked individual differences in language learning strategies used in both syntactic and semantic development (e.g., Nelson, 1973; Rodgon, 1977, Lieven, 1978).

The most marked change in research technology used in the 1970's was the more frequent use of tape recordings, plus detailed contextual notes. Beginning in the mid-seventies, investigators began to use videotape in order to examine speech contexts in detail. With this contextual information, investigators have been able to assign semantic functions to children's one-word utterances more reliably than was previously possible with sound recordings, supplemented by some contextual notes. The non-verbal context of children's utterances, such as gestures oriented toward people and objects, intonation patterns of speech, and direction of gaze, have been examined in order to interpret meaning (e.g., Greenfield & Smith, 1976; Bloom, 1970).

Currently, there is an interdisciplinary approach to language development which seeks to gain basic information about the development and use of language by children.[1] This contrasts strongly with the

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[1] A multidisciplinary approach occurs when investigators from different disciplines focus on the same phenomenon, but in isolation from each other. Theory, concepts, independent and dependent variables are derived from the investigator's own discipline, and there is little or no attempt to integrate data.

An interdisciplinary approach occurs when there is an attempt to integrate theories, concepts, variables and data from several disciplines. (Gallagher et al, 1976.)

polarized approaches of the behavioural psychologists and linguists, prevalent during the 1960's. This change from a multidisciplinary approach to an interdisciplinary approach has been accompanied by a tendency to change the research style from a deductive to an inductive one. Investigators are observing and systematically describing communication between mothers and children, seeking to induce a theory of communication development.

With the focus offered by pragmatics and the general recognition of the concept of communicative competence, the social and physical context of children's communicative attempts has been subjected to still more rigorous analysis. Changes in children's use of gestures (e.g., Parker, 1976; Iitake Kyoke, 1977; Carter, 1978; Bruner, 1978), changes in intonation (e.g., Halliday, 1973; Crystal, 1978; Dore, 1975; Bruner, 1978), and in turn-taking and topic-sharing (Bloom, Rocissano & Hood, 1976; Keenan & Schieffelin, 1976; Wellman & Lempers, 1977; Shields, 1978; Snow, 1977, 1978) and the emergence of primitive speech acts (Bates, 1976; Dore, 1975; Halliday, 1975; Bruner, 1975) have been studied to investigate the children's development of communicative skills. The use of videotape or audiotape, plus detailed contextual notes to record over several months or years the communicative attempts of a few children right from early infancy, is becoming a more common research strategy. The data are often subjected to multilevel analysis (e.g., Rodgon, 1977; Bruner, 1978).

Terminology and operational definitions of indices reflect the influence of concepts from several disciplines such as socio-linguistics, ethology, cognitive psychology.

Maternal Speech Studies

It is possible to trace similar changes in research strategies employed in studies of maternal speech (see Table I). The first group of studies in which adult speech addressed to children was investigated were undertaken in the late 1960's and early 1970's. These studies examined the validity of Chomsky's assumption concerning the nature of children's linguistic environment. Operating within the same reductionist framework and influenced by Chomsky's work, these investigators focused on the analysis of syntax of maternal speech in isolation from the context in which the speech occurred. The majority of investigators employed a cross-sectional design to examine the surface structures of maternal speech. The speech used by mothers to talk to their children of different ages was compared with the speech used by these mothers to talk to other adults (Broen, 1972; Drach, 1969; Phillips, 1973; Sachs, Brown & Salerno, 1972; Snow, 1972). In general, the studies involved children who were just beginning to talk. The emphasis lay in documenting universals or regularities in the modifications of adult speech addressed to children.

Whereas these earlier investigations had centered on the

differences in speech used by adults in talking to children and in speech used between adults, subsequent investigators assumed these differences and made further enquiry into the nature of this different mode of speech used by adults when talking to children. Few investigators continued to compare adult-child speech with adult-adult speech.

During the mid-1970's, many investigators assumed an undirectional influence from mother to child, thereby adopting implicitly the viewpoint that maternal speech contained all that was necessary to explain language (e.g., Moerk, 1976). Correlational studies were used in an attempt to relate changes in children's language development with specific features of maternal speech (e.g., Cross, 1977; Furrow, Nelson & Benedict, 1979; Nelson, 1973; Newport, 1976). Various forms such as expansions, extensions or repetitions of the children's utterances were identified in maternal speech and were assumed to be language teaching strategies. Identification and differentiation of these maternal strategies necessitated the recording and examination of the utterances of both mother and child. At this point in research, only verbal utterances were analyzed and little attention was given to the context or to non-verbal communication, even though the use of videotape recording of the entire communicative context was common.

In the late 1970's, the interest in pragmatic aspects of language was reflected in studies of interaction between mothers

and children. Investigators began to view the mother and child as a communicative system, inferring that mother and child influence each other during interaction. Use of the concept of communicative competence has resulted in detailed analyses of the communicative context (e.g., Ninio & Bruner, 1978; Ratner & Bruner, 1978), of non-verbal and gestural communication (e.g., Garnica, 1978; Gutmann & Turnure, 1979; Parker, 1976; Rodgon, 1979), of conversational skills such as turn-taking and topic-sharing (Keenan & Schieffelin, 1976; Shugar, 1978; Lieven, 1978), as well as the speech of the mother and child. The functions, rather than the form, of maternal communication strategies are being investigated by analyzing the antecedent and consequent behaviour of the child (e.g., Corsaro, 1977; Ervin-Tripp, 1978; Snow, 1978). There is increasing emphasis on individual differences in interaction between mother and child, and investigators are seeking to identify features of interaction which are critical for facilitating the development of communication (e.g., Nelson, 1977). There is a tendency to employ longitudinal designs, and an ethological paradigm, to examine changes in interaction with time, and to examine the nature of mutual adjustments by caretaker and child (e.g., Snow, 1977; Bruner, 1978; Cherry, 1979; Himes, 1978; Lieven, 1978). Research spans a wide age range, from infants and pre-verbal children (e.g., Bruner, 1978; Snow, 1978) to preschoolers and kindergarten child (e.g., Shields, 1978; Wells, 1979).

The changing trends in research designs and research strategies used in studies of child language development and in studies of the linguistic environment of young children reflect the changes in theories of language development. There has been a tendency to sum data from the numerous studies on the linguistic environment of children with little attention to the possible effects on the data on differences in research strategies and design. These methodological issues arising from studies of maternal speech and of the interaction between mother and child, will now be discussed.

Table 1: Research Trends in Observational Studies of Children's Language and of Language Spoken to Children

Theoretical Linguistic Model	Historical Period	Child Language Studies	Studies of Linguistic Environment
	Prior to 1950's (1800's to early 1900's)	"DIARY STUDIES" Longitudinal design: Changes in individual children. Paper and pencil recording. Record context, form and meaning of utterances. Age span: Infancy-3 years	No formal study, but parental speech to child recorded and used in analysis of child's meaning.
REDUCTIONIST I (Behaviourists)	1950's	"COUNT STUDIES" Cross-sectional design: Regularities across children Paper and pencil recording. Quantification of vocabulary. Age span: 18 months-5 years.	
REDUCTIONIST II Transformational Grammar	1960's	"SYNTACTIC STUDIES" Cross-sectional and a few longitudinal studies. Paper and pencil, or audiotape recording of child's utterances. Focus on syntactic constituents and transformations. Age span: 2 years-school age.	
INTERACTIONIST (Generative Semanticists, semantic-cognitive approach)	1970's (early)	"SEMANTIC STUDIES" Longitudinal and cross-sectional but stress on regularities. Audiotape plus notes on physical context and child behaviour. Interpretation and classification of child's meaning. Age span: 12 months-preschool.	"MATERNAL SPEECH STUDIES" Cross-sectional: Regularities in speech to children. Audiotape. Comparison of syntax of maternal speech to children and to other adults.
	(Mid-)		"MOTHERESE" Cross-sectional: Regularities. Audiotape plus contextual notes. Correlation of maternal syntax and language teaching strategies with child language development.
UNIFIED (Transactional approach)	(Late)	"COMMUNICATION STUDIES" Longitudinal design: Individual differences as well as regularities. Videotape, frame-by-frame analysis of physical, social, verbal context. Functions of gestural, vocal, verbal communication.	"COMMUNICATION STUDIES" Longitudinal and cross-sectional: Individual differences. Videotape. Changes in gestural and verbal communication with changes in child's communicative skills, functions of maternal communication strategies.

CHAPTER III

STUDIES OF THE LINGUISTIC ENVIRONMENT: METHODOLOGICAL ISSUES

Existing reviews have discussed many aspects of the syntax, semantics and pragmatics of mothers' and/or children's speech, and have discussed the relationship between maternal input and the child's development of language (see Bowerman, 1978; De Villiers & De Villiers, 1978; De Paulo & Bonvillian, 1978; Gleason & Weintraub, 1978; Nelson, 1978; Rees, 1978; and Snow, 1978). However, little reference has been made to either the proliferation of dependent and independent variables, or the methodological problems that exist. The diversity of study design, methods and indices of assessment makes it extremely difficult to compare the results of different studies.

This current review focuses on observational studies of interaction between mothers and their normal children or their mentally handicapped children, who were at similar language levels. The central concern of this review is the interaction between mothers and children during that period of language development in which the child begins to produce words and simple sentences. (This period corresponds to Roger Brown's (1973) first three stages of child language development.)

As a preliminary step to the integration of data from studies of the linguistic environment, an overview of these studies was developed by establishing a category system to group the

independent and dependent variables employed by researchers during the 1970's (see Appendix, Tables A1-A-5).

Every attempt was made to summarise as many studies as possible. A few studies were excluded and others may have been omitted inadvertently. Reasons for exclusion included the failure to describe or define precisely the measures used. Only those measures used by at least two different researchers, or which approximated a measure used by another researcher, are included in the Tables (see Appendix, Tables A1-A5). Given these limitations, the large number of dependent variables presented in Tables A1 through A5, do, in fact, represent a fairly exhaustive list of variables which have been used to measure various aspects of caretakers' speech to young children.

In each table, the studies are listed in chronological order, with the exception of studies involving mentally handicapped children. These studies are grouped separately at the end of each table to facilitate direct comparison of the type and range of dependent and independent variables studied in this population with those variables studied in normal children. The chronological ordering illustrates the gradual shift in focus of mother-child research that was discussed in Chapter II. The majority of studies in the early to mid-1970's focused on structural or syntactic aspects of maternal speech, whereas pragmatic indices, such as the function of questions, and conversational measures such as turn-

taking and topic-sharing, appear more frequently in studies, in the late 1970's. Some of the variables such as mean length of utterance (M.L.U.) or expansions, have been studied extensively (see Tables A1, A2, respectively, in the Appendix), whereas others, such as referents, have received relatively little attention (see Table A3 in the Appendix).

During the process of compiling these tables, it soon became evident that there was little standardisation of design. Mothers and children were observed during different situations and in different settings. Explanations of the purpose of the design and the instructions given by researchers to parents, differed. Children varied in age level, language level, and in the ages they spanned. There was wide variation in the type, range and definition of dependent variables. Previous reviewers have tended to sum the data and conclusions from many studies, taking little account of potential effects that differences in design may exert on the data. Several investigators, have, in fact, demonstrated that differences in setting, situation, or in the subject population do have a significant effect on the data (see subsections below). In addition to the vast number of indices employed in the analysis of maternal speech or of the interaction between mother and child, the definitions of these indices have frequently lacked precision and/or operationalisation, so that the same term may be used to describe different phenomena.

One major issue that was noted during the extensive survey of the literature was the tendency to report average values for maternal speech features without either presenting the raw scores for individuals or reporting measures of variability such as standard deviation or standard error of the mean. This omission of data is, of course, particularly noticeable in cross-sectional studies of sample populations larger than about six dyads. Longitudinal studies have tended to be limited to following two or three dyads over a period of six months to a year, with the exception of studies by Furrow, Nelson & Benedict (1979), Nelson (1973), and Ringler (1978). These researchers also did not include measures of variability in their reports. Comparison of data across studies to demonstrate consistency or discrepancy is not possible, unless some measures of variability are reported. Some researchers, however, have discussed the validity of their data by commenting on the consistency of data with that from other studies, without any reference to variability (e.g., Furrow, Nelson & Benedict, 1979). This issue, along with other confounding factors associated with independent and dependent variables which will now be discussed, pose major obstacles to the comparison of data.

Other main methodological issues which have been identified in this overview are first listed below and then are discussed in the corresponding subsections which follow.

1) The effect of variation in independent variables on the interaction between primary caretaker and child:
   (a) Variables in setting and situation.
   (b) Child variables: age, sex, language level, cognitive ability.
   (c) Adult variables: socioeconomic group, culture, sex, attitude toward child.
2) Dependent variables. The effect on the data of variation in the precision in criteria of definition of dependent variables.

The dependent and independent variables which have been employed during the 1970's by investigators of the linguistic environment of young children are summarised in Tables A1 to A5 in the Appendix.

METHODOLOGICAL ISSUES IN SELECTION OF INDEPENDENT VARIABLES

Variables in Setting and Situation

Recorded observations of the interaction between mothers and children either in a clinical playroom setting or in the natural home environment, have provided the data for studies of the linguistic environment of young children. The general procedure for collecting data has consisted of observing and recording (audio-tape, plus contextual notes, or audio-videotape) the interaction

between mothers and children of different ages, in various situational contexts. Both structured situations such as puzzle construction or story-telling, and unstructured situations such as free play with a wide range of toys, have been used commonly to elicit conversations between mothers and children. Few investigators have employed naturally-occurring situations such as mealtimes, bath-time, dressing or common games such as "peek-a-boo" or "give-and-take".

In a study specifically designed to examine the effect of setting on mother-child interaction, Belsky-Jay (1977) reported that there was no effect of the setting on measures of child language, but in comparison with a home setting, the same mothers in a laboratory setting showed an increase in the amount of speech and stimulation used, and in the amount of attention and responsiveness given to the child. The instructions given to the mothers in the two settings differed, which may have differentially affected their interaction with the children. In the home setting, mothers were instructed to carry on as usual with their normal routine, whereas in the laboratory setting, mothers were confined to one area and were instructed to play and talk with their children. It may be postulated that the communicative interactions and role relationship between mother and children may be very different during the thirty minutes of intense focused interaction in a strange playroom, compared with thirty minutes of interaction doing normal activities

in a home setting. According to Burton White (1979), few mothers rarely spend more than several minutes at a time sitting with their children, but do a lot of talking on the run.

These data, however, conflict with the concept of the mother-child dyad as a highly interdependent system in which each member influences the behaviour of the other. In this case, one would expect changes in maternal behaviour to be reflected in the child's behaviour. Along these lines, research has shown that differences in natural responsiveness are associated with differences in aspects of child language (particularly frequency of initiation and response) (Lieven, 1978; Cross, 1977; Rodgon, 1979). It may be postulated that the measures of child language were not sensitive to small changes in behaviour, or that overall changes during one or two occasions in frequency of patterns of interaction, but not in the nature or quality of patterns themselves, do not affect the child's participation. If the frequency only of maternal interaction is increased in a laboratory setting, the use of this setting may be advantageous for examining patterns of interaction or problems in interaction.

In addition to the effect of the setting, the differences in maternal behaviour reported by Belsky-Jay (1977) may reflect maternal sensitivity to experimental demands, in that mothers behave in a more "desirable" manner when being observed closely in a laboratory setting, than when moving around freely at home.

Zegiob et al (1975) had investigated this effect by observing the interaction between mothers and children in a clinical playroom setting, during informed and uninformed conditions. Mothers were more active in structuring the children's activities and in praising their children in the informed situation when observers and recording devices were present, than in the uninformed condition in which mothers were naive to the presence of a recording device. Unfortunately, no measures of child behaviour were taken.

In order to provide additional information on the effect of setting, an attempt was made to compare the data from studies carried out in the home with that from studies in a laboratory setting. In light of other confounding factors such as age and language level of the child, the situation used, and the socio-economic and cultural background of the mother (see discussion below), after an extensive search of the literature, comparison of data across settings was only possible in two studies, namely Cross (1977) in a home setting, and Snow et al (1976), in a laboratory setting. Both researchers had analyzed data from a similar number of dyads (16-18 dyads) in which the children spanned a comparable age range (Snow (1976) 18-38 months; Cross (1977) 19-32 months). Snow et al (1976) had analyzed maternal speech in both free-play and structured situations, and across different socioeconomic classes. Only the data on speech of mothers from the academic middle class, in the free-play situation, are presented in Table 2, to

allow comparison with Cross' (1977) data. However, as no measures of the children's language skills were taken by Snow (1976), it is not known whether the children in both studies had comparable linguistic skills. In addition, mothers in Snow's (1976) study were Dutch, and cultural differences are reflected in some aspects of maternal speech (see Chapter III, p. 65).

Measures of variability, such as standard deviation or standard deviation of the mean, were not included in the reports of either of these two studies. Statistically, therefore, it is not clear that the data are comparable, but taken at face value, there are apparent differences (see Table 2). Hence, the following discussion is based on the assumption that the apparent differences are significant. As shown in Table 2, the most noticeable differences across the settings are in the percentages of declaratives and expansions. The frequent use of declaratives by mothers in the laboratory setting (Snow et al, 1976) may reflect a greater quantity of speech in that setting than in a home setting, consistent with the report by Belsky-Jay (1977). This high frequency of commenting on events or activities may also reflect mother's reaction to the unfamiliar setting or mother's interpretation of the researcher's instructions (see Zegiob et al, 1975).

However, mothers in the home setting more frequently incorporated their children's topics into their responses by expanding the children's utterances, than mothers in the laboratory

setting. Interaction in the home setting also elicited the use of more questions by the mother than did the laboratory setting. Expansions are by definition a type of maternal response to the child's utterance, and questions are frequently used by mothers in response to their children to clarify the children's responses (Corsaro, 1977), and to keep the conversation going (Corsaro, 1977); Malzone & Parker, 1979; Mishler, 1975). This suggests that the mothers in the home setting were more responsive to their children's communicative attempts than mothers in the laboratory setting, which contradicts the conclusions drawn by Belsky-Jay (1977).

The limited data available indicate the need for future research. At present, the data on the effect of setting on mother-child interaction remain equivocal.

Table 2: Comparison of Maternal Speech during Play Session with Child in Two Settings: Home[a] and Laboratory[b]

Feature of Maternal Speech	Values Reported in Home Setting[c]	Values Reported in Laboratory Setting[c]
M.L.U.	4.8 (Morphemes)	3.9 (Words)
Interrogatives	33%	24%
Declaratives	27%	62%
Imperatives	7%	11%
Self-Repetition	28%	19%
Expansion	18%	8%
Exact Imitation	3%	5%

a - Data from study by Cross (1977).

b - Data from study by Snow et al (1976).

c - Values rounded to nearest whole percentage, with the exception that M.L.U. reported as in literature.

Cazden (1970) proposed that the topic, the task, and listeners were situational variables that might affect the fluency and spontaneity, the length, complexity and the content of sentences used by preschool and school-aged children. These same variables were likely to be equally important, if not more so, with children who are just beginning to talk (Nelson, 1978). Research has shown that with adults, shifts in the form of speech concur with changes in role, topic, task, and/or setting (Ervin-Tripp, 1968; Sacks & Schegloff, 1978). A few investigators have examined the effect of situational variables on adult speech addressed to children.

Different situations, such as free play, story-telling, teaching a task or feeding or dressing, but not task difficulty, had differential effects on the structural characteristics of maternal speech addressed to children (see Table 3). Mothers tend to use longer sentences, talk more frequently, using more complex syntax, use a wider variety of words, and ask more questions (specifically wh-type questions) during story-telling than during free play or teaching the child a specific task (Bakker-Renes, 1976; Broen, 1972; Fraser & Roberts, 1975; Golnikoff, 1979; Snow et al, 1976). In story-telling, the situation is well-defined, with limited topics for dialogue, which allows for more advanced dialogue in terms of exchanging information, than in less well-defined situations. When instructing a child in a specific task such as construction of specific shapes, or puzzles, both mothers and fathers

tend to talk more, use longer sentences, and give more directives, but ask fewer questions than when playing with toys with children (Golnikoff, 1979). Mothers tend to talk less and use shorter sentences which are grammatically simpler, during caretaking activities such as feeding, bathing, or dressing, than during free play or story-telling (Bakker-Renes, 1976; Snow, 1977). Snow (1977) proposed that mothers talk less to children during feeding because, when they do talk, they try to engage young children in conversations. Participants in conversations are required to alternate in the role of speaker and listener (see Chapter IV, p. 95). Mothers talked when the children's mouths were not full so the children could assume the role of speaker and respond.

Situational differences may explain the large discrepancies in data which occur frequently in the literature. For example, Snow (1972) reported an average value of 6.6 words per utterance used by mothers talking to 2-year-old children during a structured task. In contrast, Longhurst (1975) reported a maternal mean length of utterance as 3.8 words per utterance, talking to 2-year-old children during a free-play situation. Definitions of M.L.U. the age level and socioeconomic background of the child, were comparable. The situations differed, but there was also the additional confounding factor that no measures of the children's language level were taken. Variation in children's language level is also associated with variation in maternal M.L.U. (see following section and Table 4).

Table 3: Effects of Different Situations on Adult Speech to Children.

Situation**	Features of Adult Speech*				
	Sentence Length	Frequency of Verbal Interaction	Syntactic Complexity	Directives	Questions
Story-telling	1	1	1	3	1
Free Play	3	3	2	2	2
Structured Task	2	2	3	1	3
Caretaking	4	4	4	?	?

* Numbers indicate rank order. For each feature of maternal speed, the rank of 1 is assigned to the situation in which that feature occurred with the highest frequency, or which had the highest numerical value. For example: mothers used the longest sentences during story-telling (Rank 1), and the shortest during caretaking (Rank 4).

** Table compiled from data from following studies:
Broen, 1972; Fraser & Roberts, 1975; Bakker-Renes, 1976; Snow et al, 1976; Snow, 1977; O'Kelly-Collard, 1978; Golnikoff & Ames, 1979. Measures of variability were not reported in any of these studies, so data were taken at face value.

To summarise, the communicative demands of different settings and situations vary, and will, in turn, influence the interaction between mother and child. Researchers should consider the possible effect on the data of settings and situations. The relevance of different settings and situations for different purposes has been summarised by Ramey et al (1978). Naturalistic observations in the home are relevant for generating hypotheses about mother-child interaction. Standardised observation in a common laboratory using various tasks or situations is useful for examining individual differences on set dimensions. Constrained observation using both a standardised task and a common setting allows for testing explicit hypotheses.

Variables in Selection of Children

The distinctive features of speech used by adults when talking to young children have been well-documented. These features are manifested at all levels of analysis of language: at the level of phonology, intonation, word selection, sentence length, sentence form and function, syntax, and semantics (for reviews, see De Villiers & De Villiers, 1978; De Paulo & Bonvillian, 1978; and Snow, 1977). While seeking to substantiate a "fine tuning" hypothesis (Cross, 1975, 1977; Newport, 1976) which postulates that mothers' speech is adjusted to small increments in children's linguistic skills, several investigators demonstrated that some of these features do change over time. For

example, some investigators have proposed that the structural complexity of adult speech increases as a function of child age (Broen, 1972; Fraser & Roberts, 1975; Nelson, 1973; Phillips, 1973; and Snow, 1972), or as a function of the child's expressive language abilities (Cross, 1975; Glanzer & Dodd, 1975; Moerk, 1974; Pfuderer, 1969), or as a function of the child's level of comprehension (Cross, 1977; Gleason & Weintraub, 1978).

An apparent controversy exists in the literature concerning the direction of change of various parameters of maternal speech. For example, Phillips (1973) reported that the mean length of mother's utterances (M.L.U.) to 8-month-olds was the same as that used by mothers to 18-month-olds. However, mothers used longer sentences to 28-month-olds than to 18-month-olds (see Table 4). This conclusion was challenged in a more recent study by Himes (1978) who reported an increase in maternal M.L.U. with time, observing children 12, 16 and 20 months' old (see Table 4). Similar controversies were noted throughout the literature concerning changes in maternal use of various sentence types, self-repetition and other parameters. More detailed examination of the studies revealed wide variation in the age levels, age range and, presumably, linguistic levels of the children, and in the type of design. These details plus the conclusions of the investigators, concerning the nature of changes in 14 parameters of maternal speech, are presented in Tables 4, 5 and 6.

Both the cross-sectional and longitudinal designs present several problems in analyzing changes in adult speech addressed to children. First, in a cross-sectional approach, researchers have frequently matched children on chronological age, and grouped them into two or three different age levels, which may range across six months or even one year or more (e.g., see Table 4; Fraser & Roberts, 1975; Phillips, 1973). Children at the same age level may differ greatly in language abilities, but frequently no measures of child language have been taken. These studies, therefore, cannot distinguish between the effects on adult speech of children's age and their language level. Another issue relates to the intervals at which measurements are taken. Children's communicative abilities change rapidly during the first few years of life, and in light of current understanding about the reciprocal influences between mother and child (e.g., Bruner, 1978; Himes, 1978; Lieven, 1978; Moerk, 1977), these changes are likely to be paralleled by changes in maternal communication. Observation of mothers and children at intervals of six months, one year or several years, using either a cross-sectional (e.g., see Table 4; Longhurst, 1975), or a longitudinal design (e.g., see Table 4; Ringler, 1977), may miss many intermediate changes in maternal speech. Generally, researchers using a cross-sectional design have selected a sample size of 10 to 36 dyads, with the youngest children being at the early verbal stage, producing single

words or word combinations. Thus, the data represent the mean values from all the dyads, and rarely are any measures of variability reported (refer to earlier discussion, p. 38). In contrast to cross-sectional design, researchers using a longitudinal design have tended to observe just two or three dyads, at intervals of often only a few months (one of the exceptions: Ringler, 1977), spanning the preverbal and early verbal period. The case study approach has been used in reporting data, highlighting individual differences, The ability to generalize conclusions to other dyads is therefore limited.

TABLE 4: VARIATIONS IN FEATURES OF MATERNAL SYNTAX AS A FUNCTION OF CHILD AGE AND/OR LINGUISTIC LEVEL

Features of Maternal Speech	Researchers		Design	Increase as a Function of Child's Age or Language Level	Decrease as a Function of Child's Age or Language Level	No Change with Increases in Child's Age or Language Level
Mean Length of Utterance (M.L.U.)	Snow	1972	Cross-sectional	2-10 years		
	Nelson	1973	Longitudinal, Correlational	M.L.U. - 12-25 months		
	Phillips	1973	Cross-sectional	18,28 months		8,18 months
	Moerk	1976	Cross-sectional and Individual Data	M.L.U., Age, 20 months-5 years		
	Fraser & Roberts	1975	Cross-sectional	18,30 months		30 months, 4,6½ yrs during story-telling
	Longhurst, et al	1975	Cross-sectional	24,36 months		12-24 months
	Lord	1975	Longitudinal	6-11 months	11-18 months	
	Newport	1976	Cross-sectional, Correlational	M.L.U., Age, 12,26 months		
	Cross	1977	Cross-sectional, Correlational	M.L.U., Age, Comprehension, 19-32 months		
	Snow	1977	Longitudinal			3-21 months
	Himes	1978	Longitudinal, Correlational	12,16,20 months		
	Furrow et al	1979	Longitudinal, Correlational			M.L.U., Age, 18,27 months
	Gunn et al	1980	Longitudinal (Down's Syndrome)			4-17 months
Type Token Ratio	Broen	1972	Cross-sectional	21 months-5 years		
	Phillips	1973	Cross-sectional	18-28 months		8-18 months
	Fraser & Roberts	1975	Cross-sectional	18-30 months, 4-6½ years		
	Longhurst, et al	1975	Cross-sectional			12-24-36 months (Carroll Type)
	Remick	1976	Cross-sectional and Individual Data			16-30 months
	Ringler	1977	Longitudinal	12-24 months		
SENTENCE COMPLEXITY						
Clause/Utterance	Snow	1972	Cross-sectional	2-10 years		
	Fraser & Roberts	1975	Cross-sectional	18-30 months		
Verbs/Utterance	Phillips	1973	Cross-sectional	18-28 months		8-18 months
	Furrow et al	1979	Longitudinal, Correlational	M.L.U., 18-27 months		
Proposition/Utterance	Newport	1976	Cross-sectional, Correlational			M.L.U., Age, 12-26 months
	Cross	1977	Cross-sectional, Correlational	Comprehension 19-32 months		M.L.U., Age, 19-32 months
	Furrow et al	1979	Longitudinal, Correlational			M.L.U., 18-27 months

Table 5: Variations in Form of Maternal Utterances as a Function of Child Age and/or Linguistic Level

Feature of Maternal Speech	Researchers		Design	Increase as a Function of Child's Age, Language Level	Decrease as a Function of Child's Age, Language Level	No change with Increase in Child's Age, or Language Level
SURFACE SENTENCE TYPE (Q: INTERROGATIVES) (C: IMPERATIVES) (S: DECLARATIVES)	Broen	1972	Cross-sectional			Q,C,S: 21 months, 5 years
	Longhurst	1975	Cross-sectional			Q: 12,24,36 months
	Newport	1976	Cross-sectional Correlational	S: M.L.U., Age 12-27 months	C: M.L.U., Age 12-27 months	Q: M.L.U., Age 12-27 months
	Cross	1977	Cross-sectional Correlational		Q: Age, 19-32 months	Q: M.L.U. Comprehension C: M.L.U., Age S: Comprehension
	Ringler	1977	Longitudinal	Q,S: 12-24 months		C: 12-24 months
	Snow,	1977/78	Longitudinal	Q: 12-18 months	Q: 3-12 months	C,S: 3-18 months
	Furrow	1979	Longitudinal Correlational	C: Age, M.L.U. 18-27 months		Q,S: Age, M.L.U. 18-27 months
	Shatz	1979	Cross-sectional			Q: 18-34 months
SELF-REPETITION	Snow	1972	Cross-sectional		2,10 years	
	Newport	1976	Cross-sectional Correlational		M.L.U., Age Vocabulary Size 12-27 months	
	Cross	1977	Cross-sectional Correlational		M.L.U., Age Comprehension 19-32 months	
	Ringler	1977	Longitudinal		12-24 months	
	Himes	1978	Longitudinal Correlational			12-16-20 months
	Gunn et al,	1980	Longitudinal (Down's Syndrome)			4-17 months
EXPANSIONS	Reichle	1976	Cross-sectional			24,36 months
	Newport	1976	Cross-sectional Correlational	Age, Vocabulary Size, 12-27 months		
	Cross	1977	Cross-sectional Correlational		M.L.U., Age, Comprehension 19-32 months	
	Himes	1978	Longitudinal Correlational	12-16-20 months		
EXTENSIONS	Reichle	1976	Cross-sectional	24,36 months		
	Cross	1977	Cross-sectional Correlational			M.L.U., Age, Comprehension 19-32 months
	Himes	1978	Longitudinal Cross-sectional	12-16-20 months		

Table 6: Variations in Functions of Maternal Utterances as a Function of Child Age and/or Linguistic Level

Feature of Maternal Speech	Researchers	Design	Increase as a Function of Child's Age or Language Level	Decrease as a Function of Child's Age or Language Level	No change with Increase in Child's Age, Language Level
QUESTION FUNCTIONS					
Test Questions	Holtzman 1972	Longitudinal		M.L.U. (1-4 Morpheme)	
	Remick 1976	Cross-sectional Individual Data		22-30 months	18-22 months
	Cross 1977	Cross-sectional Correlational		M.L.U., Age, 19-32 months	
	Himes 1978	Longitudinal Correlational			12,16,20 months
	Lieven 1978	Longitudinal	18-26 months (2 our of 3 dyads)		
Genuine Questions	Holtzman 1976	Longitudinal			M.L.U. of child
	Longhurst, 1975	Cross-sectional	24,36 months		12,24 months
	Remick 1976	Cross-sectional Individual Data	22-30 months		17-22 months
	Lieven 1978	Longitudinal		18-26 months (2 out of 3 dyads)	
	Snow 1978	Longitudinal	3-18 months (1 dyad)		3-18 months (1 dyad)
Clarification Questions	Longhurst, 1975	Cross-sectional	12,24 months	24,36 months	
	Remick 1976	Cross-sectional Individual Data	18-22 months	22-30 months	
	Corsaro 1977	Longitudinal		2½,5 years	
	Himes 1978	Longitudinal Correlational	12,16,20 months		
Directives	Lieven 1978	Longitudinal 3 dyads			18-26 months
	Gunn 1980	Longitudinal (Down's Syndrome)	(4-17 months)		
CONTENT					
References to Child Only	Cross 1977	Cross-sectional		Age, Comprehension, 19-32 months	
	Snow 1977	Longitudinal		3-18 months	
	Gunn 1980	Longitudinal Down's Syndrome	4-12 months	12-17 months	
References to Object, Actions, Events in Immediate Context	Snow 1977	Longitudinal	3-18 months		
	Gunn 1980	Longitudinal (Down's Syndrome)	4-17 months		
References to Non-Immediate Actions, Events (Past, Future)	Remick 1976	Cross-sectional Individual Data	18-30 months		
	Cross 1977	Cross-sectional Correlational	M.L.U., Age, Comprehension, 19-32 months		
	Snow 1977	Longitudinal	3-18 months		

Two of the issues mentioned in the preceding paragraph, matching children for chronological age and/or language level, and the selection of age groups, will be discussed in more detail and illustrated with examples from Tables 3, 4 and 5.

A quick glance at these tables suggests inconsistency of data throughout all the parameters. Closer inspection, however, reveals differences between studies in the age grouping of children, the age range studies, and in the type of design. The selection and matching procedures may, in fact, account for many of the apparent inconsistencies.

Most researchers have selected first-born children from the academic middle, socioeconomic class. Generally, these children exhibit advanced linguistic skills, and their speech is fluent and highly intelligible. Lieven (1978) did not use these criteria in selecting children, but just matched children approximately for age and for mean length of utterance. The children showed wide variation in other parameters of language such as the number of semantic relations expressed, vocabulary range, intelligibility and comprehension. These differences in measures of child language were associated with differences in maternal responsiveness, and resulted in marked interaction differences in turn-taking and keeping the meaning going in conversations. Another researcher, O'Kelly-Collard, 1978, also selected children who were not as linguistically sophisticated for

their age as those in other studies. The frequency of occurrences of several parameters of maternal language differed from prior studies, in that they would usually be associated with maternal speech to much younger children.

Matching children for chronological age and/or linguistic stage is particularly relevant in correlational studies examining the relationship between maternal speech and children's language growth (e.g., Cross, 1977, 1978; Furrow et al, 1979; Himes, 1978; Newport, 1976; Newport et al, 1977). Matching children along both dimensions (age/stage) is necessary to ensure that initial differences in children are not responsible for either initial variation among mothers or for sebsequent variation among children (Furrow et al, 1979). Referring to Table 4, it can be seen that Cross (1977), Himes (1978), and Newport (1976) reported an increase with time in maternal M.L.U., but Furrow et al (1979) reported no change with time. The age ranges of the children in the four studies overlap to some extent, and there are differences in design. The fact that only Furrow et al (1979) matched children closely for both age and linguistic stage may well, however, account for the discrepancy between their data and those of the other three studies.

The effect of matching children for chronological age versus linguistic level on the data, is also relevant in studies comparing maternal speech addressed to mentally handicapped children with that

addressed to normal children (see Table 7). When the children were matched for chronological age (e.g., Buium et al, 1974; Kogan et al, 1969; Marshall et al, 1973), differences were found in many measures of maternal speech addressed to these two groups (see Table 7). This matching results in a wide variation in language abilities, so the design could not distinguish between the effects on maternal speech of age and linguistic level of the child. No differences were reported in maternal speech to mentally handicapped and normal children when the children were matched for mean length of utterance (Rondal, 1976). However, matching for language level in Rondal's study resulted in the age group of mentally handicapped children ranging between 3 and 12 years, while that of the normal group ranged between 20 and 30 months. The children's exposure and experience with language in the two groups is hardly comparable. O'Kelly-Collard avoided this problem by matching children for "level of expressive and receptive language skills", and by selecting normal children who were less advanced linguistically for their age than children in other studies, was able to match for age also. No major differences were reported between the two groups.

Table 7: Characteristics of Linguistic Input to Mentally Handicapped Children: Effects of Matching.

Investigators	Normal and Mentally Handicapped Children Matched for:	Chronological Age Range of Children	Differences Reported in Maternal Speech to Mentally Handicapped Children Relative to Maternal Speech to Normal Children
Kogan et al, 1969	C.A.[a]	Subjects: 3-7 yr Controls: 4-5 yr	Yes. More restraints, prohibitions.
Marshall et al, 1973	C.A.	3-5 yr	Yes. More comands, requests, questions.
Buium et al, 1974	C.A.	24 mos	Yes. Measures of syntax. (More grammatically incomplete sentences, imperatives, questions, to which mothers supply answers. Shorter sentences.) Fewer wh-type questions conjunctions, indefinite pronouns.
Rondal 1976	M.L.U.[b]	Subjects: 3-12 yr Controls: 20-30 mos	No. (20 parameters of syntax, semantics, form of conversational strategies.)
O'Kelly-Collard, 1978	M.A[c] Receptive and Expressive language age	Subjects: 22-54 mos Controls: 16-20 mos	No. (36 out of 38 parameters of syntax, semantics, form of conversational strategies.) More declaratives and exact imitation of child's utterance.

Note:

[a]C.A. Chronological Age.

[b]M.L.U. Mean Length of Utterance.

[c]M.A. Mental Age.

The last issue relating to selection of children that will be discussed is that pertaining to the sex of the children. While most researchers have selected approximately equal numbers of boys and girls, some have selected just girls (e.g., Newport, 1976) or just boys (e.g., Gleason, 1975). Frequently, the data have not been analyzed for the effect of sex, but some researchers have indicated that parents interact differently with boys and girls. Mothers tended to address a larger quantity of vocal/verbal behaviour to one-year-old daughters than to one-year-old sons (Goldberg & Lewis, 1969). The data were replicated by Cherry & Lewis (1978). Mothers tended to remain in closer physical proximity with girls than with boys. They spoke more, used longer sentences, asked more questions and repeated the child's utterances more frequently when talking to two-year-old girls than to two-year-old boys. These differences in maternal speech to young boys and girls were not found by other researchers studying children of between the ages of 12 and 28 months (Fraser & Roberts, 1975; Golnikoff & Ames, 1979; Himes, 1978; Phillips, 1973), or preschool age children from different socioeconomic classes and different races (Zegiob & Forehand, 1975). Golnikoff & Ames (1979) reported only one difference between parental speech to boys and girls, namely that both mothers and fathers tended to take more turns and slightly shorter turns with boys than with girls in a structured situation. This controversy is not readily explained by situational

differences; both Golnikoff & Ames (1979) and Fraser & Roberts (1975) used structured situations, while the other researchers used free play to elicit mother-child conversations. Only Cherry & Lewis (1976) and Golnikoff & Ames (1979) matched the boys and girls on mean length of utterance as well as age, so it is possible that the boys and girls in other studies differed in linguistic abilities. At present, the data remain equivocal.

The data and discussion presented here indicate that the procedures used to select and match children have influenced the outcome of studies, and hence the conclusions drawn by researchers. These procedures should be examined prior to generalising research findings to children of different linguistic abilities, age levels, or age groups.

Variables in Selection of Adults or Other Conversational Partners: Age, Sex, Class, Culture, and Attitudes

The majority of researchers have studied conversations between children and mothers from white, American, middle class homes. Three assumptions have generally been made. First, researchers selected mothers because they assumed that mothers provide the major portion of their children's early linguistic environment. Secondly, there has teen a tendency to assume universals of input and to generalise speech data from mothers of the academic middle socioeconomic class to all mothers, with little account taken of

possible class and cultural differences in mother-child interaction (e.g., see conclusions by Tamir, 1979; Furrow et al, 1979; and Snow, 1972). Finally, as a result of these previous assumptions, and based on the main corpus of data, there has been an implicit assumption that mothers must play a major role in language development. A few researchers have even assumed that maternal speech contains all that is necessary and sufficient to explain the development of language in children (e.g., Moerk, 1976; Pfuderer, 1969).

Data from cross-class and cross-cultural studies have challenged some of these assumptions. For example, pertaining to the central role played by mothers, the interaction between children and mothers from the middle socioeconomic class may well be an atypical social situation for children in the rest of the world. Mothers from the white, American, middle class homes tend to spend long stretches of time alone with their children, and tend to engage them in frequent periods of intensive interaction. In contrast, Den Blount (1972), studying the Luo of Kenya, wrote:

> After the age of 1, and older sibling, preferably a girl between the ages of 4-11, will be assigned as a nursemaid for the child... The nursemaid continues to be the major source of speech input until the child is 3-3½ at which time the peer group becomes the major sources... From my observations, the speech input from

> adults seems to be quite insignificant during this period. (Cited by Slobin, 1969, p. 12.)

Similar conditions have been reported in Samoan and South Indian society, and in other tribes in Kenya (Blount, 1972; Harkness, 1977; Slobin, 1969), although Slobin (1969) reports that the Mayan culture resembles Western culture in the quantity and intensity of mother-child interaction. Also, with the increasing use of daycare and other child care services, the assumptions may not even be valid for the Western culture.

Depending on the culture and historical period, other children and adults may provide large portions of the young child's linguistic environment. The term "primary caretaker" is applied to the person(s) who interacts with the child for most of his/her waking hours. Despite these observations, until the late 1970's, there had been relatively little systematic observation of the speech addressed to young children by other adults, such as fathers or daycare workers, or by older children or peers.

There is some indication that linguistic environments provided by older children and peers differ from that provided by mothers, and may not be as facilitating to language acquisition (Bates, 1974; and Harkness, 1977). If this hypothesis were substantiated, there would be major implications for infant stimulation programmes. Earlier theories (Piaget, 1926) characterized peer language as egocentric, allowing little flexibility to take into account the

communicative needs of their conversational partner. Data from recent research have, to some extent, modified these earlier assumptions. Children as young as four years old make some modifications in their speech to younger children, namely in frequency, rate and syntactic complexity of utterances (Anderson & Johnson, 1973; Gleason, 1973; Harkness, 1977; Masur, 1978; Sachs & Devin, 1976; and Shatz & Gelman, 1973). These modifications resemble those made by mothers to young children, but in contrast to maternal speech, older children and peers tend to ask fewer questions, or expand or extend the utterances of the younger children (Harkness, 1977; Sachs & Devin, 1976). These are features in adult speech which keep the topic of conversation going, which may be used to ensure mutual understanding (see Corsaro, 1977; Sacks, Schegloff & Jefferson, 1975), and which correlate highly with advanced linguistic skills in children (Cross, 1978; Newport, 1976).

A few researchers have investigated fathers' speech to young children. Friedlander, Jacobs, Davies & Wetstone (1972) reported that in two families, 30-37% of the linguistic environment was provided by the father, in contrast to 59-65% provided by the mother. Fathers do modify their speech to young children, but these modifications do not always parallel those of mothers (Gleason, 1975; Gleason & Weintraub, 1978; Golnikoff & Ames, 1979; Kriedberg, 1975; Weintraub, 1976). Fathers and male daycare teachers

tend to use more imperatives than mothers or female daycare teachers, whether in the home, in a laboratory, or in a daycare centre (Gleason, 1976; Kriedberg, 1975; Weintraub, 1976). The highest percentage of imperatives were used in the home setting; their fathers were not as constrained by requirements of politeness as in the laboratory or daycare setting (Gleason & Weintraub, 1978). However, Golnikoff & Ames (1979) did not find differences in the use of imperatives by fathers and mothers. The study was carried out in a laboratory setting, similar to the study by Weintraub (1976), but the children were much younger than in other studies (1½ years old in the study by Golnikoff & Ames, compared with 3-year-olds in other studies). This discrepancy may, in fact, be an artifact of child age. Differences in mothers' and fathers' speech may reflect their perception of sex roles. Greater differences between the speech of adult males and females occurred in a home setting than in a daycare setting. In the latter setting, male and female teachers shared the child-caring role. However, this generally was not the case at home. It would be interesting to examine the speech of single fathers, who retain custody of their young children, or of those fathers who participate frequently in the daily caretaking activities.

Although all mothers may modify their speech when talking to young children, considerable variation exists between mothers of the same socioeconomic class (Cross, 1978; Lieven, 1978;

Nelson, 1973; Rodgon, 1977), across different socioeconomic classes (e.g., Holtzman, 1972; Ringler, 1978; Schacter, 1979; Snow et al, 1976), and across different cultures (e.g., Blount, 1972; Harkness, 1975, 1977). The tendency to use many commands is a characteristic associated with mothers from the low socioeconomic class (Ringler, 1978; Snow et al, 1976; Zegiob & Forehand, 1975), and from different cultures such as Dutch (Snow et al, 1976), Samoan (Konan, 1969), Kenyan (Blount, 1972; Harkness, 1977), and South Indian (Slobin, 1969). Mothers from the low socioeconomic class tend not to incorporate and elaborate the child-initiated topics into their own responsive utterances by using expansions and extensions as frequently as middle class mothers (Schacter, 1979). The relatively infrequent use of commands and frequent use of expansions and extensions by mothers correlate with advanced linguistic skills in children from middle class homes (Cross, 1978; Newport, 1976). Children from low socioeconomic backgrounds tend to exhibit less sophisticated linguistic skills than middle class children (Hess & Shipman, 1965; Bernstein, 1961; Blank, 1976). Comparative data of children's linguistic abilities from other cultures are not known.

There has also been a tendency for researchers to assume that all mothers make similar modifications in rate and intonation. Whereas most mothers from English-speaking homes tend to speak slowly, with exaggerated intonation to young

children, in Guatemalan culture, "rather than slowing down, the Guatemalan mothers used a rapid-fire monotonic style when speaking to their young children" (Harkness, 1975, p. 496). This, so far, is the only exception reported.

Several researchers have speculated that these differences in various features of language addressed to children, are intricately related to attitudes, intentions, and expectations of the caretaker (Ervin-Tripp, 1978; Gleason & Weintraub, 1978). The way in which mothers talk to children may be related to their beliefs and knowledge concerning their children's communicative abilities (Bingham, 1971; Gleason & Weintraub, 1978), or their attitudes toward role-relationships between adult and child (Blount, 1972; Ervin-Tripp, 1978).

Certainly communicative intentions, and hence the speech of caretakers, vary across different situations (see Table 2, Chapter III). When requesting specific behavioural and/or verbal responses from the child during intensive interaction, caretakers' speech is more carefully tuned to the child's linguistic skills and level of comprehension than when commenting on various events or the child's activities in passing. Interpretation of the researchers' instructions may also affect the caretakers' speech. During the observed interaction, some adults might concentrate on eliciting the linguistic or cognitive skills of the child, while others are preoccupied with demonstrating the "good" behaviour of

the child.

In summary, data from many "peripheral" studies have challenged the assumptions held by the central core of research on speech of middle class mothers: namely that there are universal features of children's early linguistic environment, which are provided primarily by mothers.

There is evidence that no matter from what class or culture, infants and language-learning children are spoken to in different ways than are adult members of the society. There is some indication, however, that speech addressed to the elderly, or to handicapped or hospitalized people may exhibit some sililar features to adult-child speech (Blount, 1977).
It may be more accurate to suggest that it is primary caretakers rather than mothers who play a major role in facilitating the development of communicative competence in children. In many instances, mothers are the primary caretakers, but as more women enter the work force, this may no longer be true. This is particularly relevant in the middle class in Western society, the population which has provided the data base for most of the research on maternal speech. Certainly cross-cultural studies have demonstrated that the primary caretakers are older children, rather than mothers.

Several researchers have proposed that not only do primary caregivers play a major role in facilitating children's development of communicative competence, but also their patterns and/or style of

interaction with the child may facilitate the rate and quality of development (e.g., Cheseldine & McConkey, 1979; Cross, 1978; Himes, 1978; Moerk, 1976, 1977, 1978; Nelson, 1977). If this hypothesis is substantiated further, then there are major implications for professionals working in daycare centres, infant stimulation programmes and for other primary caretakers.

ISSUES IN DEFINITION OF DEPENDENT VARIABLES

Problems in interpreting and integrating the data from studies measuring features of maternal syntax arise partly from differential effects on the data by the use of different settings and situations and by the use of children at different age levels and/or different linguistic levels. Operational definitions of indices of syntax are generally precise, yielding high inter-rater reliability and ease of interpretation of data for the reader. However, researchers may use different definitions and criteria to measure the same feature of maternal speech. For example, the mean length of utterance may be measured by the mean number of words, morphemes, or syllables per utterance, and various criteria may be used for identifying and counting these elements (e.g., see Brown, 1978; Cross, 1978; Newport, 1976; and Snow, 1972). Counting morphemes and syllables per utterances will result in somewhat inflated scores compared to those obtained by counting words. This fact may partly account for the discrepancy in data presented by

two researchers, both measuring mothers' mean length of utterance (M.L.U.) when talking to two-year-olds in a free-play situation. Lieven (1977), counting morphemes per utterance, reported values of 5.6 and 7.3 for the M.L.U. of two mothers. In contrast, Longhurst (1975), using the same situation and children of the same age level, but counting words per utterance, reported the average M.L.U. for 36 mothers to be 3.8. Only Lieven reported the language level of the children. Consequently, differences in language abilities may also partly account for discrepancy, as mothers tend to use longer sentences as a function of the child's increasing sentence length (see Table 4).

Several investigators counted morphemes for one member of the dyad, and words for the other member (e.g., Nelson, 1973; Lieven, 1978; Newport, 1976). Comparison of sentence lengths of mother and child are not reliable in these studies.

Another frequently used measure which has been defined precisely, but for which there are two definitions, is the type-token-ratio (TTR), a measure of the diversity of vocabulary. The two different definitions most likely explain the discrepancy concerning changes over time in maternal TTR (see Table 4). Longhurst (1975), using the Carroll formula for assessing TTR did not find changes in this measure of maternal speech as a function of child age. Other researchers (e.g., Fraser & Roberts, 1975; Ringler, 1977), using the more conventional measure of TTR, reported an increase

over time with increasing child age over similar age ranges.

Numerous indices have been used to analyze the surface form of maternal conversational strategies such as self-repetition, and exact imitation or expansion of the child's utterances (for range of indices, see Cross, 1977; Newport et al, 1977; Reichle, Longhurst & Stepanich, 1976). Definitions of these features frequently lack precision,and classification involves subjective judgment by the rater(s). Inter-rater reliability is not always reported. In addition, researchers have used different criteria for classifying and/or counting aspects of mothers' speech to which the same term has been assigned. For example, many researchers have analyzed the frequency of expansions of maternal speech. Brown et al (1969) and Reichle et al (1976) both measured the frequency of expansions as the percentage of the child's utterances which are expanded by the mother. In contrast, other researchers have measured the frequency as the percentage of the mother's utterances which are expansions. The two children studied in their homes by Brown et al (1969) were linguistically advanced and were offspring of highly educated parents: both factors likely influence the data. These differences in factors of age and linguistic sophistication of children, and in measurement factors, may account for much of the wide discrepancy between the high frequency of occurrence of expansions (30%) reported by Brown et al (1969), and the much lower frequency (1-10%) reported

by other researchers (e.g., Cross, 1977; Harkness, 1977; Nelson, 1973; Newport, 1976). Reichle et al (1976) also failed to find high occurrence of expansions (4%), even though they used the same definition as Brown et al (1969). These researchers studied many more dyads in a laboratory setting, and commented that the children in their study were not as advanced linguistically and were not as fluent as the two children studied by Brown et al (1969). In addition to these factors, Newport (1976) proposed that the data from Brown et al (1969), may well be inflated by the mothers' use of expansions extensively to interpret and clarify their children's utterances for the benefit of the researcher.

Different terms may be assigned to comparable definitions by different researchers. Thus, the term "expatiation" used by Reichle et al (1976), is used to classify the same thpe of maternal responses which are termed "extensions" by other researchers (e.g., Lieven, 1978; and Cross, 1977).

There is an even wider variation among definitions at the pragmatic level in recent studies on features of interaction between mother and child. For example, there is little agreement among researchers on how to define turn-taking (e.g., see Minio and Bruner, 1978; Lieven, 1978; Kaye & Charney, In Press; Cross, 1978), or on how to classify different functions of questions (e.g., see Cherry, 1979; Corsaro, 1978; Holtzman, 1972; Snow, 1978).

On a more positive note, there is tendency to include more

detailed descriptions of definitions of these pragmatic indices along with examples from dialogues, than were included in earlier reports on the surface form of maternal speech (e.g., see details given by Bellinger, 1979; Cherry, 1979; Ninio and Bruner, 1978; Rodgon, 1977).

The difficulties encountered in interpreting and categorizing difinitions of indices, during the process of compiling Tables A1-A5 (in the Appendix), arose from both the lack of precision and the diversity of definitions. Integration of data from all of these studies on the child's linguistic environment, into a comprehensive body of knowledge, is dependent upon reliable interpretation of the data. This latter condition is almost precluded by the lack of precision in definitions which leads to subjectivity in their interpretation by observers during study and by other researchers reviewing the literature.

The wide variation and subjectivity in definitions may be illustrated by selecting a typical type of utterance mother might give in response to a child's brief and unclear utterance. This same response would have been classified differently by different investigators. For example, the mother's response of "Daddy's car?" to the child's utterance "Dada ca!" would have been classified as

an imitative response by Folger and Chapman (1978), an expansion by Cross (1977), a question by Snow (1972), an interpretation by Blount and Padgug (1977), or as a request for clarification by Corsaro (1977). Thus, the data and hence the conclusions, will depend on the type of measures selected, on the definitions, and whether each utterance was classified at only one level (e.g., syntactic or pragmatic), or at multilevels as proposed by Rodgon (1977).

SUMMARY

This chapter has focused on methodological issues arising from studies of the linguistic environment of young children. A large corpus of data on caretaker speech to children already exists. However, the wide variation in setting and situation, in procedures of selecting and matching both children and their conversational partners, and in selection and definition of measures, has made interpretation of the data difficult and frequently unreliable. Discussions focused on the effect of uncontrolled variables on the data, and hence on the conclusions of the researchers. Several tables were compiled to illustrate discrepancies in the literature such as the direction of change with time of various maternal speech parameters (Tables 4, 5, 6) or issues related with matching procedures (Table 7). Another set of tables (Tables A1-A-5 in the Appendix) was developed to document the range of studies, the types of measures used and details of the design. The data presented

in this chapter indicate the need for precision of definitions, and the need to strive for validity of the data while controlling for intruding variables. The term 'validity' is used here to mean the degree to which the data are representative of typical parent-child interaction.

As well as identifying and discussing several methodological issues, it is hoped that this chapter and the tables within the text and in the Appendix will offer researchers and students both a framework for considering features of design and a reference source which may be updated and/or modified.

CHAPTER IV

CARETAKER-CHILD INTERACTION: THE DEVELOPMENT OF COMMUNICATIVE COMPETENCE

The theme of this chapter changes from a focus on methodological issues to one on the relationship between children's linguistic environment and the process of development of communicative competence. The data and conclusions of the various studies discussed in this chapter must, however, still be examined for confounding factors associated with methodological issues, as discussed in the preceding chapter.

RELATIONSHIP BETWEEN MATERNAL SYNTAX AND CHILDREN'S LINGUISTIC SKILLS

Most of the studies of children's linguistic environment have been dominated by the Reductionist Model of language, in which language is perceived as a system of grammatical features and rules (refer back to Chapter II, p. 8). Observational studies have revealed that mothers' speech to young children is different to speech between adults, and also changes with variations in the child-listener (e.g., Broen, 1972; Cross, 1975; Drach, 1969; Phillips, 1973; Snow, 1972). Consistent with the assumptions of the Reductionist Model, the analyses have focused primarily on maternal syntax and on the form of mothers' conversational strategies such as expansions or self-repetitions (see Tables A1, A2 in the Appendix).

The modifications in maternal speech have sometimes, and erroneously, been assumed to be evidence in itself for the role played by the child's linguistic environment in language development (e.g., Vorster, 1975).

Fine-Tuning Hypothesis

Several researchers have indicated that maternal speech is flexible and sensitive to the child's linguistic needs, so that its syntactic complexity changes over time to be just in advance of the child's linguistic skills (e.g., Broen, 1972; Nelson, 1973; Phillips, 1973). This proposition, referred to explicitly by Cross (1975; 1977); Newport et al (1975), and Pfuderer (1969), is often called the "fine-tuning hypothesis". Clear evidence that mother's syntax is correlated with measures of child's linguistic abilities, rather than with age, is required to support this hypothesis (Cross, 1977). Cross (1977) and Newport et al, (1977) only found a few, low correlations between maternal syntax and children's linguistic skills. Furrow et al, (1979), however, reported more extensive correlations and attributed the differences in data to methodological issues. In this study, the children were matched closely for age and linguistic stage, a design feature not present in correlational studies by Cross, (1977, 1978); Himes, (1978); or Newport et al (1977). To date, however, there is insufficient evidence to support the "fine-tuning hypothesis".

Conversational Hypothesis

Snow (1977) proposed that the changes over time in features of maternal speech are better explained in terms of their function in communicating with the child by initiating conversations and keeping them going, than in terms of being finely tuned to the child's age or linguistic level per se. Support for this "conversational" hypothesis is provided by data from two different approaches to research, from studies investigating the function of maternal communicative strategies, and from studies examining the relationship between features of maternal speech and children's later linguistic skills. The first approach is discussed in the next section, but the latter approach will be discussed here.

It is not possible to infer causal connections with concurrent mother-child correlations; however three researchers (Furrow et al, 1979; Himes, 1978; Newport et al, 1977) examined the relationship between features of mothers' speech at $Time_1$, and children's speech at $Time_2$. The major findings are summarised in Table 8. The study by Cross (1978) was included as this cross-sectional study had compared maternal speech to linguistically advanced and to normal children, matched for mean length of utterance, in order to identify characteristics of maternal speech which promote the rate of linguistic development. Referring to Table 8, many of the features relate to the conversational strategies such as self-repetition,

Table 8: Association of Features of Maternal Speech with Children's Subsequent Linguistic Skills.

Researchers and Design	Age Range of Children	Features of Maternal Speech	
		Features Positively Associated with Linguistic Growth	Features Negatively Associated with Linguistic Growth
Cross, 1978 (Cross-sectional)	19-33[a]	Self-repetition Imitation Expansion Repetition of expansion.	Unintelligible utterances Large number of utterances/turn Novel utterances (not referring to child's utterance) Preverbal complexity
Furrow et al, 1979 (Longitudinal)	18→27	Yes/no questions Use of more nouns than pronouns.	Long sentences Pronouns Verbs Contractions
Himes, 1978 (Longitudinal)	12→16→20	Responds to child Clarification questions Wh-type question Imitation Expansion Acknowledgements (Approvals) Self-repetition Descriptions	No response Yes/no question Directives Performatives (restraints) Disapprovals
Newport et al, 1977 (Longitudinal)	13→19[b]) 19→25) 25→31)	Yes/no questions Deixis Expansions	Imperatives Self-repetition

Note: [a]Pairs of children matched for mean length of utterance. Younger of the pair placed in "Accelerated Group"; older in "Normal Group".

[b]Three age groups (12-15, 18-21, 24-27 months) formed at initial session, then examined again 6 months later.

expansions or initations of the children's utterances. Most of these strategies are, in fact, responses to the child's utterance. Both Cross (1978) and Himes (1978) describe the style of interaction which best predicts language growth in the child, as one in which the mother accepts and responds to the child's utterances, and follows the child's lead by commenting on his/her activities, or adding to his/her topics of conversation. Furrow et al (1979) also offered an interpretation of their data on syntactic features along similar lines. Young children have more difficulty in processing abstract as opposed to concrete concepts (e.g., Piaget, 1926). Therefore, mothers' use of more nouns in relation to verbs and pronouns, which are less concrete than nouns, may identify referents more clearly, resulting in successful communication. Furrow et al (1979) commented that:

> It is not unreasonable to suggest that communicative success facilitates language growth; indeed, we would be surprised if the benefits of simple speech did not derive at least in part from being linked to successful communication. (P. 438.)

An association between success in communication and promotion of language development is also implied in the conclusions of studies investigating the function of maternal strategies, which are discussed in the following section.

FUNCTION OF CARETAKERS' COMMUNICATIVE STRATEGIES

The spoken form of spoken utterances does not necessarily correspond to the purpose for which the utterance was used. For example, the surface form of the utterance "It's cold in here!", is a simple affirmative declarative, and may function as a statement of fact. The speaker, however, may intend the utterance to function as a request for the listener to turn up the heat, or to shut the window. The utterance then functions as an indirect request and not as a statement. If spoken by a mother to get her child to put on a sweater, it functions as a directive (Rees, 1978). These functions are called illocutionary acts (Searle, 1969), and they depend more on the speaker's intentions and on the specific context in which they are used, than on the surface form of the utterance.

Several researchers have inferred the intentions underlying caretakers' use of various surface forms in their speech to young children, by examining the context in which they were used and their effect on the children's subsequent behaviour (e.g., Corsaro, 1977; Schumaker, 1976; Snow, 1978).

Self-Repetition

Approximately one-third of the total maternal utterances are self-repetitions (Benedict, 1975; Kobashigawa, 1969). Snow (1972) observed that many self-repetitions occur in sequences which

consist of different noun phrases and prepositional phrases from the original utterance. These sequences were thought to provide a model of phrase structure for the child. For example:

"Put the red truck in the box now.
The red truck.
No, the red truck.
In the box.
The red truck in the box."

(Snow, 1972, p. 562.)

The children's behaviour, however, was not observed in this study, and no further investigations of this hypothesis were carried out. Cross (1975) and Gleason (1977) reported that maternal self-repetitions were most frequently a response to the child's failure to respond appropriately.[2] The amount of information given to the child at any one time in the reduction/repetition sequence illustrated above, is reduced, while the meaning is maintained. These sequences could give the child more time to process the intended meaning (Benedict, 1975, 1978; Cross, 1975, 1978; Ervin-Tripp, 1977; Himes, 1978). Newport (1976) examined the probability of response by two-year-olds to their mothers' repetition sequences. She concluded that these sequences were mainly attentional as their use increased the overall likelihood of the mother eliciting

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[2]It is reasonable to speculate that Snow's (1972) example of a repetition sequence, given above was the mother's response to her child's failure to carry out her initial directive.

a response from the child. Newport argued that if self-repetition served to facilitate comprehension, more responses should be elicited by later repetitions. This conditional probability did not occur. However, another researcher (Messer, 1980), proposed that self-repetitions facilitate comprehension by increasing predictability in the child's linguistic environment. Messer (1980) noted that there was a tendency for mothers to refer repeatedly to the same object by name over a string of successive utterances, called verbal episodes. Furthermore, the beginning and end of these verbal episodes concerning the same referent were clearly marked with pauses. The child is likely to be easily able to identify these episodes and is provided with several opportunities to associate a verbal label with the referent, to promote comprehension of the spoken word.

Expansions and Extensions[6]

Brown and Bellugi (1964) were among the first researchers to recognize the potential impact that mothers' expansions or extensions of their children's utterances, might have on the children's acquisition of syntax. This form of conversational strategy attracted the attention of many researchers, most of whom

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[5]Definitions vary, but in general the term extension refers to responses which expatiate on the topic of the child's utterance.

examined the incidence of expansions and extensions (see Table A2 in the Appendix). Several researchers investigated experimentally, the effects of supplying expansions, extensions or recasts[7] of the child's utterances, on the child's acquisition of specific syntactic forms. Originally no effects were reported (Cazden, 1965; Feldman, 1971), but subsequent studies have reported predicted effects on the child's acquisition of specific forms (e.g., Hovell et al, 1978; Nelson et al, 1973; Nelson, 1977; Schumaker, 1976).

Different types of expansions have been idenfified by analyzing the change in direction of intonation at the end of the expansion-utterances, which implies different functions (e.g., Bushnell & Aslin, 1977; Schumaker, 1976; Slobin, 1968). The expansion-question uttered with a rising terminal pitch, has received the most attention (see Table A3 in the Appendix). Several researchers observed that children respond to this type of expansion with an affirmative, or repeat whole or part of their previous utterances. Furthermore, children tend to respond differently to different forms of these expansion-questions (Bushnell & Aslin, 1977; Cherry, 1979; Corsaro, 1977; Garvey, 1977). This type of expansion,

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[7]Recasts are responses which maintain the meaning of the preceding utterance, but which change the syntactic form, e.g., a child's statement "Dat horsie" may be recast as a question as in "Yes, it is a horsie, isn't it?"

frequently called a request for clarification, may well serve to aid the mother in clarifying and confirming the child's message, to check on mutual understanding, and thus increase the likelihood of communicative success. Frequent use of expansions by mothers is a good prediction of the child's linguistic growth (see Table 8). Thus, both propositions may hold, namely that expansions may facilitate the acquisition of specific forms, and that expansion-questions increase the likelihood of the child's communicative success.

Questions

Sentence type is not necessarily equated with sentence function, and particularly in conversations between mothers and young children. In an early study, Holtzman (1972) observed that both mothers and children used the interrogative surface structure to make suggestions and reports, as well as to elicit information. Information-seeking questions were not always used by mothers to obtain new information, but were used frequently to test the child's knowledge. Many subsequent studies have investigated th various functions served by mothers' use of the interrogative surface form (see Table A3 in the Appendix). Questions used in conversations generally function as prompts to indicate to the partner that a verbal or non-verbal response is required. That is, they act as turn-passing devices (Sacks, Schlegoff & Jefferson, 1974). Questions are used to initiate interactions and to sustain or extend

conversations (Mishler, 1975). In the sustaining role, questions form one type of adaptation strategy used to re-establish communication following a breakdown in turn-taking or comprehension of the shared referent (Ervin-Tripp, 1978; Gleason and Weintrub, 1978; Moerk, 1976; Rees, 1978; Snow 1978).[8] Breakdown in mutual understanding occurs frequently in conversations between mothers and children. Brown, Cazden and Bellugi (1969) described mothers' use of one particular form of question they called constituent prompting. This was an adaptation-question strategy used to elicit a response from a child following non-response to the original question. For example, when the child did not respond to the question "What does the doggie say?", the mother modified her question, "The doggie says what?". Similarly, Ervin-Tripp (1978) describes sequences of discourse-repair strategies employed by an experimenter when the child did not respond to the initial question, or responded inappropriately to subsequent adaptation strategy. Questions were rephrased, reduced in length, or altered in type, which had the net effect of altering the amount of information given at a time, and of clarifying the information required. Questions functioning to elicit a repetition or clarification of the child's preceding utterance are all subsumed

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[8]These concepts such as terms, turn-passing and breakdown in turn-taking will be elaborated in the section on conversations, communication breakdown, and repair strategies (beginning on p. 93).

under the more general heading "Clarification Requests" (Corsaro, 1977), or "Text-contingent Queries" (Wells et al, 1979). The expansion-question discussed in the preceding section was one type of clarification request. Corsaro (1977) and Cherry (1979) reported that children responded differently to the different forms of clarification requests.

Questions appear to be multifunctional strategies as illustrated by a longitudinal study of mothers' use of questions with infants (Snow, 1978). In a longitudinal study, Snow (1978) examined the types and functions of questions used primarily to initiate interactions. Mothers used similar forms of questions throughout the study, but the question sequences were used for different functions and were terminated differently as the child grew older. When the child was 3 months'old, questions were used to establish joint reference by following the child's focus of attention. Burps, grins or coos were accepted as the child's turn, or the mother answered her own questions. At 7 months and 12 months, the same type of questions were used to focus the child's attention on the mother's activity, but by 18 months, questions were used didactically to elicit specific verbal or behavioural responses. Generally, the use of questions requiring a non-specific response from the child decreased, while those requiring specific responses increased as a function of the child's age. The child's rate of response to mother's questions also increased with age. Snow (1978)

concluded that the type of questions asked and the type of response expected and accepted by the mother were governed by the mother's assessment of her child's ability to function as a conversational partner.

The use of questioning strategies with young children would appear to have a major influence on the development of communicative competence, in that questions elicit responses, and when used to check mutual understanding, encourage appropriate and clear responses. Excessive use of questions may have a constraining effect on spontaneous conversation (Hubbell, 1977; Marshall, Hegrenes & Goldstein, 1973; Nelson, 1973). Pilot language intervention programmes involving mothers and children, demonstrated that increases in the child's mean length of utterance, and in the frequency of talking, were associated with changes in the mother's interaction style. These changes included an overall decrease in the use of questions and commands, and an increase in the use of comments or statements (Cheseldine & McConkey, 1979; Seitz, 1975). Similarly, Mimes (1978) reported that frequent use of questions only requiring a yes/no response, in addition to not responding to the child's utterances, but demanding responses from the child, may well impede language development.

Mothers' Gestures

In conversation, information is conveyed not only through

language, but also through facial expression, intonation, hand and arms gestures, and body posture (Birdwhistell, 1968). Mothers' use of intonation and other suprasegmental aspects of language such as volume, stress, pause, etc., has been examined in many of the earlier studies (see Table A5 in the Appendix). Recently, several researchers have focused on mothers' use of hand and arm gestures when talking to young children (Garnica, 1978; Gutmann & Turnure, 1979; Murphy and Messer, 1977; Parker, 1976; Rodgon, 1979). These are also presented in Table A5.

Murphy and Messer (1977) demonstrated how mothers' use of pointing becomes an effective strategy for focusing the child's attention on an object. Garnica (1978) investigated the frequency and types of gesture used concomitantly with verbal requests for action by mothers addressing one-, two- and three-year-old children. Mothers of one-year-olds used many more non-verbal cues than mothers of three-year-olds. With the younger children, the gestures were used simultaneously with, or immediately after the verbal request, and included explicit modelling of the requested action, manipulation of the objects, or actual physical handling of the child. Mothers of three-year-olds tended to refrain from using gestures, unless the child had not followed verbal requests after several repetitions. Then, non-verbal cues tended to be more subtle and were restricted to pointing or modelling the requested action. Similarly, Parker (1976) reported a general decrease over time in

mothers' use of gestures, but also noted that mothers reverted to the use of gestures when teaching new concepts, or when a child was using a linguistic form inconsistently. The data imply that gestures facilitate the child's comprehension of the spoken utterance.

Two studies (Gutmann & Turnure, 1979; Rodgon, 1979) used the same coding system for gestures, that was developed by Weiner, Devoe, Rubinow & Geller (1972). Three major categories in this system are deictics, i.e., pointing gestures; pantomimics, which are gestures illustrating some attribute of the object or event; semantic relational gestures, which add to the verbal message, and are the type of hand movements used by adults.

Rodgon (1979) found that mothers used primarily deictic gestures when talking to both two- and four-year-olds in a free-play or puzzle-play session. These children also produced mainly deictic gestures, which illustrates a close match between mothers' and children's non-verbal behaviour, as well as in verbal behaviour. No significant effects due to age of the child were found for either frequency or type of gesture. Gutmann and Turnure (1979), however, reported that task and child age differences did influence mothers' gesture production. Mothers of older children (four- to five-year-olds) tended to use more gestures overall, and in particular more semantic gestures than mothers of younger children (two- to three-year-olds). Task conditions strongly influence both the type and frequency of gestures produced (Gutmann & Turnure, 1979).

Differences in tasks selected most likely account for the opposing data on the effect of child age on mothers' use of gestures.

These studies illustrate how both mothers and children use gestures to convey their meaning or to interpret each other's meaning. The need for further research in this area is clearly indicated both by the small number of studies in Table A5, and by the role played by gestures, in facilitating mutual understanding.

To recapitulate both the long-term relationship between various features of maternal speech and the child's subsequent language development (e.g., Furrow et al, 1979; Himes, 1978; Newport et al, 1977), and the immediate relationship between these features and the child's communicative behaviour (e.g., Cherry, 1979; Corsaro, 1977; Holtzman, 1972; Snow, 1978), have been examined in this chapter. Many of the differences in the speech between adults and that between child and primary caregiver, arise from both the asymmetrical relationship and the unequal distribution of linguistic, social and cognitive knowledge, between adult and child. Modifications in the speech of primary caregivers may be better interpreted as adaptation strategies used primarily to increase the likelihood of communicative success, rather than as teaching strategies designed to facilitate the child's acquisition of syntactic forms.

In light of the information generated from the studies,

the earlier intense focus on maternal syntax, analyzed in isolation of context, now appears to be a misfocus and, therefore, misleading. The earlier studies have, in fact, provided valuable descriptions of the speech of middle class mothers, and were in keeping with the available theories concerning the nature of language. The emerging Transactional theory of the development of communicative competence was discussed in Chapter II. Interpretation of the data generated from the numerous studies investigating the characteristics and function of the child's linguistic environment, in terms of adaptation strategies, falls within the framework of the Unified model of language and the Transactional approach to development (see Chapter II).

The remaining section of this chapter will examine the way in which the conversational interactions between primary caregivers and children change over time, in order to achieve a fairly consistent level of successful exchanges.

CONVERSATIONS, COMMUNICATION BREAKDOWN AND REPAIR STRATEGIES

Many researchers propose that the roots of communicative skills originate in the first social interactions between caretaker and infant, and that there is continuity of the child's communicative behaviour from the early preverbal stages to the later linguistic stages (Bates, 1976; Bruner, 1975; Freedle and Lewis, 1977; Halliday, 1975; Harris, 1975; Riegel, 1978; Sugarman, 1973; Tamir, 1979).

In addition, there is growing evidence that while there is basic continuity between the communicative scaffold, established between caretaker and infant in the first few months, and the subsequent patterns of interaction between caretaker and child, the quality of the interaction changes (e.g., Bruner, 1975; Ninio and Bruner, 1978; Snow, 1978). The term communicative scaffold is used to describe the prerequisites of interaction such as mutual attention, turn-taking and reciprocity. Bruner (1975) has described how the mutual phasing of attention between caregiver and child promotes the establishment of joint reference on some entity or topic within the immediate environment. Any action, vocal or verbal behaviour from either child or primary caregiver, serves as a comment on the joint reference. The topic-comment structure of these early interactions are assumed to be the precursors of the verbal topics in later conversations. Terms such as topics, turn-taking, and communication breakdown, which are appearing with increasing frequency in analyses of interaction between caretaker and child, are derived from sociolinguistic and philosophical studies of conversation. These new developments are providing many insights into the process of interaction and how the interaction might stimulate and facilitate language development. As these concepts seem far removed from linguistic concepts of phonetics, syntax and semantics, the general principles and dynamics of conversation will be summarised before discussing the research applied to caregiver-

child interaction.

Organisation and Principles of Conversation

During conversational interaction, participants constantly strive to bridge the gap in shared knowledge or experience in components, in order to reach their communicative goals (Allen & Guy, 1974). The term 'communicative goal' refers to the initial intentions of the speaker and to any subsequent intentions that develop during interaction. Conversations are initiated by attracting another's attention, and by establishing joint attention on the intended referent or topic, such as an event, an object, or an idea. In conversations between adults, referents are frequently abstract or not present in the immediate environment.

In order to bridge the gap in shared knowledge, the initiator of the interaction must integrate available information from the immediate context and referent with existing cognitive representations of past social, cognitive and linguistic experience. Taking into account his expectations of the listener's knowledge, the initiator then selects verbal and non-verbal options from his store of knowledge, which realised as a speech act, will express his intention. While the initiator is talking, the listener must similarly interpret the incoming verbal, non-verbal and contextual information in the light of his part experience and then, taking over the role of speaker, produce an

appropriate communicative response. Generally, participants maintain this sequential and contingent of interaction until their communicative goals are reached. This continuation and cohesiveness of conversation is achieved by each participant contributing and interpreting new information, by maintaining mutual understanding, and clarifying misunderstandings, while observing the rules of turn-taking (Sacks, Schegloff & Jefferson, 1974), the Gricean Co-operative Principle (Grice, 1975), and the conversational principles described by Gordon and Lakoff (1975). These conversational rules or procedures will now be explained.

The rules of turn-taking place constraints on each participant not to keep on talking, but to alternate in the role of speaker and listener, not to interrupt the other, and not to change the subject abruptly, but to respond and continue the topic of the other's turn. Various devices are described for the speaker to indicate the completion of his turn and to select the next speaker, for speaker self-selection, and for repairing errors and clarifying misunderstandings (Duncan, 1972; Fillmore, 1973; Sacks et al, 1974). Grice (1975) identifies four maxims of the Co-operative Principle which relate to the informativeness, brevity, felicity, relevance, and precision of utterances contributed by each participant. According to Grice (1975), when a speaker unintentionally violates any of these principles, there will be a breakdown in mutual understanding, and the listener must try to

understand what the speaker was intending to say. Gordon and Lakoff (1975) defined a set of conditions which must be observed by the speaker, to enable the listener to believe that the speaker is sincere and that the utterances are reasonable. For example, mothers, in fact, violate the sincerity condition when they ask a child a question, to which both the mother and the child know the answer. Observation of these conversational principles maintains continuity of the structure of conversation, in that participants may change to different topics in a conversation, without an interruption in the pattern of verbal interchanges. Adherence to these rules also maintains cohesion or continuity of topic or theme, in that speakers incorporate and elaborate in their response, the topic of the preceding speaker's turn. Operational definitions of the terms 'topic', 'conversational continuity' and 'thematic cohesion' remain elusive, and many models are being developed in attempts to capture the way in which individual utterances from separate participants are integrated into a sequential and cohesive conversational interaction (e.g., see collected papers in C. N. Li (Ed.), Subject and topic, particularly Keenan & Schieffelin, 1976; also Brown, in press; Kaye & Charney, in press; Shields, 1978; Wells, Montgomery & MacClure, 1979).

Conversations may be terminated prematurely by the withdrawal of one participant from the interaction; by the intrusion of an object, event or person external to the interaction,

or by the failure to re-establish communication following a breakdown in turn-taking or in mutual understanding (Allen & Guy, 1974; Keenan & Schieffelin, 1976). Once a breakdown in mutual understanding occurs, repair strategies must be employed to re-establish communication before any additional new information can be conveyed (Keenan & Schieffelin, 1976). Breakdown in mutual understanding may occur as a result of the speaker's inaccurate assessment of the listener's existing knowledge about the referent or topic. Thus, by providing insufficient information, speaker and listener no longer share the same presuppositions or background information that is assumed to be given: shared presuppositions are an essential condition for mutual understanding (Brown, in press; Keenan & Schieffelin, 1976; Rees, 1978). Repair strategies, used to re-establish mutual understanding, occur with high frequency in conversations between, adults and in conversations between adult and child. This feature of conversations has attracted the attention of many researchers, resulting in the use of numerous terms: contingent queries (Garvey, 1977), clarification requests (Cherry, 1979; Corsaro, 1977; Langford, 1978), discourse repair strategies (Cross, 1975), repairs (Schegloff, Jefferson & Sacks, 1977), side sequences (Jefferson, 1972), subroutines (Moerk, 1976), and text-contingent exchanges (Wells, Montgomery & MacClure, 1979). Communication breakdown and repair sequences are of particular concern in this thesis. In light of their high frequency of occurrence in adult-child

interaction, and the information accrued from re-establishment of successful communication, these sequences may play a major role in promoting language development (Cherry, 1979; Shields, 1978). This point will be elaborated in the following discussion of the negotiation of conversation between adult and child. In keeping with the central theme of this thesis on the role of the linguistic environment, the discussion will focus primarily on studies approaching the interaction from the viewpoint of the primary caregiver.

Bridging the Gap in Shared Knowledge

Several researchers have commented on the asymmetrical relationship between primary caregiver and child (Harris, 1975; Kaye & Charney, in press; Tamir, 1979). Thus, while caregivers and children exert a reciprocal effect during interactions (e.g., see Bruner, 1978; Lieven, 1978; Moerk, 1978), caregivers, as competent language users, carry the major responsibility for the success of these interaction (Bloom, Rocissano & Hood, 1976; Kaye & Charney, in press; Moerk, 1976; Shugar, 1978). Success largely depends on the caregiver's skills and willingness to interpret the child's non-standard utterances, and to adapt his/her own communicative strategies to facilitate the joint achievement of the communicative goals of both caretaker and child (see Snow, 1978b; Tamir, 1979a, b).

In contrast to the abstractness of topics of conversation between adults, those between adult and child are generally restricted to concrete objects, events, or people in the immediate situation (e.g., see Cross, 1978; Remick, 1971; Snow, 1977), and are in the context of familiar routines and games (e.g., Ninio & Bruner, 1978; Bruner, 1978; Ratner and Bruner, 1978; Snow, 1977, 1978). In this way, the topics fall within the child's range of experience. Caregivers also modify the form of their utterances in various ways, such as shortening the length of utterances, repeating or reformulating their utterances, exaggerating changes in intonation, speaking slowly, and using hand gestures and facial expressions extensively (for review of features, see De Villiers & De Villiers, 1978; De Paulo & Bonvillian, 1978; Snow, 1977). These modifications may serve more to bridge the gap in shared knowledge by reducing the amount of information conveyed at any one time (Benedict, 1975, 1978; Himes, 1978), increasing redundancy in verbal communication (Messer, 1978, 1980), increasing the perceptual salience of key words, objects, or events (Newport et al, 1977), and to gain and maintain the child's attention (Ninio and Bruner, 1978; Snow, 1978), than to promote the child's development of syntax as originally postulated by some researchers.

Initiation of Conversation

Conversations between adults are generally initiated by one

participant attracting another's attention, using one of the standard verbal 'opening' phrases such as "Hey, Bill!", or "Excuse me, sir", depending on the situation and the social status of the interested participants (Schegloff, 1968).

Interaction between caregiver and child is also initiated by the establishment of joint attention and joint action (Bateson, 1975; Bruner, 1975, 1978; Kay, 1977), but frequently, non-verbal means are used, such as holding up a toy, or touching the child, in addition to calling the child's name. Initially, caregivers impose joint attention by fitting their behaviour to the child, ascribing meaning to most of the infant's behaviour, following the infant's line of vision, and commenting on the behaviour (Kaye, 1977, Sanders, 1969). Gradually, the infant begins to initiate interaction, typically by directing the adult's attention toward an object which then serves as the mutual focus and topic of conversation (Bruner, 1975; Bates, Camaioni & Volterra, 1975; Sanders, 1969). In the literature, a sensitive and responsive caregiver is described as one who picks up on these non-verbal initiations and follows the child's lead by observing what he attends to in the environment, and commenting on the child's topic (Bruner, 1975; Cross, 1975; Tamir, 1979). Thus, caregivers may appear to initiate the majority of conversations for the first two years, in terms of making the first verbal comment, but in many instances, they may be <u>responding</u> to the child's non-verbal request

for joint attention. In true initiations, caregivers may modify the form of their speech to request and maintain the child's attention by using exclamations or the child's name to initiate the conversation (Broen, 1972; Bruner, 1978; Ninio & Bruner, 1978). Some caregivers whisper to use a high-pitched voice, exaggerated intonation changes (Blount & Padgog, 1978; Garnica, 1975; Ryan, 1978), or use gestures to point to an object, or to touch the child (Garnica, 1978; Gutmann & Turnure, 1979; Rodgon, 1979). Having established joint attention, caregivers frequently continue their turn by asking a question, in order to elicit a response from the child (Malzone & Parker, 1979; Moerk, 1976; Ninio & Bruner, 1978).

Turn-taking

Conversation proceeds by both participants alternating in the roles of speaker and listener. Primary caregivers tend to impose turn-taking on the newborn by inserting comments or 'responses' into the off-cycles or gaps in the infant's activity (Kaye, 1977), but active turn-taking by the infant, such as smiling and vocalising in turns, may be observed in mother-child interaction as early as three months of age (Bateson, 1975; Stern, 1976; Stern et al, 1975). Caregivers may promote the development of verbal turn-taking by modelling the child's turn (Ervin-Tripp, 1970; Snow, 1977), or by using turn-passing strategies such as pausing or ending with a question (see Sacks, Schegloff & Jefferson,

1974), which are phrased in such a way to enable the child to contribute something from his limited verbal repertoire (see Brown, Cazden & Bellugi, 1969; Ninio & Bruner, 1978; Shugar, 1978; Snow, 1977, 1978). These adaptation strategies used by primary caregivers increase predictability in the interaction by forming a stable communicative structure or scaffold into which the child rapidly learns to slot his/her response, using a gestural, vocal, or verbal mode. Snow (1977) commented that whereas the main goal in conversations between adults is to get one's turn, in adult-child conversation, the main goal is to get the child to take a turn.

Violation of turn-taking by caregivers, such as the failure to respond to the child's intelligible utterances, or to pause to allow the child to respond, destroys the scaffold and has an immediate detrimental effect on the communicative interaction (Lieven, 1978; Rodgon, 1977). It may be postulated that consistent violation of turn-taking would exert a long-lasting effect on the child's communicative skills.

The most common violations of turn-taking by young children are non-responses and non-relevant or non-contingent responses (Bloom, Rocissano & Hood, 1976). No matter what the cause (i.e., lack of attention or non-comprehension or non-compliance), a breakdown in turn-taking generally elicits the use of repair strategies by caregivers.

Maintenance of Mutual Understanding

Conversation is maintained by both participants contributing and interpreting new information, and ensuring mutual understanding through the resolution of ambiguity and clarification of misunderstandings, while observing both the rules of turn-taking and the postulates of conversation (Allen & Guy, 1974; Cherry, 1979; Goffman, 1964; Gordon & Lakoff, 1975; Grice, 1975; Labov & Fanshell, 1977; Sacks, Schegloff & Jefferson, 1974).

Breakdown in mutual understanding between adult and child occurs frequently as a result of violations of these conversational rules by both adults and children. Children often fail to give sufficient background information for the adult to share the same presuppositions in order to understand the child's communicative attempts (Keenan & Shieffelin, 1976). In addition, many young children do not speak clearly, and may also whisper or shout, so that their pronunciation is distorted.

Adults often fail to take into account the limits of the child's linguistic, social and cognitive skills, and either overestimate or underestimate this knowledge. Overestimation occurs when the adult refers to objects or events far removed in time and/or place from the immediate context before the child can understand the immediate past (Sachs, 1979), or has a concept of object permanence (Piaget, 1926). Underestimation occurs when the adult asks the child a question to which both the adult and

the child know the answer (e.g., use of test-questions). Frequent and continued use over many months of test-questions or yes/no type questions (which place little communicative demand on the child) without continually assessing the child's abilities, may well impede the child's growth of communicative competency (Himes, 1978; Wells et al, 1979).

Whenever a breakdown occurs in mutual understanding, conversational participants must employ various repair strategies to re-establish communication before any further information can be conveyed successfully (Keenan & Schieffelin, 1976).

As primary caregivers are generally competent in the knowledge and use of language, they hold most of the responsibility for maintaining mutual understanding, and have been observed to use various strategies termed 'discourse repair strategies' (Cross, 1977), or 'contingent queries' (Garvey, 1977) to re-establish communication following a breakdown. The importance of these breakdowns and repairs in communication in the child's development of communicative competence has been stressed by Cherry (1979), who proposed that:

> The process of conversational interaction between the child and co-speaker creates a demand for the child to use language appropriately to negotiate communication with the speaker... Both the pressures occasioned by communication breakdown and the rewards occasioned

by communication breakthrough motivate this learning process. (pp. 121-122.)

This proposition is supported by the empirical studies of the relationship between features of the speech of primary caregivers and the child's later linguistic skills, which were discussed at the beginning of this chapter (e.g., Cross, 1978; Furrow et al, 1979; Himes, 1978; Newport et al, 1977). The concept of communicative success was either explicitly (e.g., as in Furrow et al, 1979) or implicitly (Cross, 1977; Himes, 1978) expressed in the conclusions of these studies. The frequent use of wh-type questions as opposed to yes/no questions, of nouns as opposed to pronouns, of requesting clarification of the child's utterance and responsing to the child's topic, were all features of prime caregiver speech which were highly correlated with the child's linguistic growth. Himes (1978) called these strategies with contrasting effects, language-advancing strategies and language-retarding strategies. Language-advancing strategies (e.g., responses to child, requests or comments, expansions, clarification questions) are those strategies which tend to maintain or regain mutual understanding, so that primary caregiver and child can bridge the gap in their shared knowledge.

Several researchers have referred to various repair strategies used by caretakers to interpret and to obtain clarification of the children's utterances or gestures, and to

elicit a response from the child following non-response or an inappropriate response to the original request (e.g., Blount & Padgug, 1977; Bridges, 1979; Cherry, 1979; Cross, 1977; Corsaro, 1977; Ervin-Tripp, 1978; Garnica, 1978; Moerk, 1976; Shatz, 1977; Snow, 1978). The forms and the functions of some of these strategies were discussed earlier in this chapter. Many different strategies have been described, such as topic-changing, reformulation of the original message, repetition, request for clarification, request for confirmation, modelling the answer or changing gestures. Several researchers have implied that a hierarchy exists in these strategies in terms of the level of demand placed upon the child (e.g., Bridges, 1979; Cherry, 1979; Ervin-Tripp, 1978). For example, Cherry (1979) postulated that requests for the child to confirm his previous utterance are more difficult for the child than requests to repeat it, since the former request often requires the child to make judgments about complex grammatical structures, while the latter only requires the child to repeat the original utterance. This would appear to be an important hypothesis for further investigation in view of the potential application for teaching strategies in language intervention programmes.

Other researchers have investigated the negotiation of conversation from the child's viewpoint, documenting children's abilities to adapt their speech to the needs of the listener (e.g., Black, 1978; Guralnick & Paul-Brown, 1980; Keenan & Schieffelin,

1976; Shields, 1978; Wellman & Lempers, 1977), and to respond to and initiate repair strategies (e.g., Gallagher, 1977; Keenan & Schieffelin, 1976; Wellman & Lempers, 1977), and to maintain and develop the topic (e.g., Bloom, Rocissano & Hood, 1976; Bohannon & & Marquis, 1977; Cook, 1977; Greenfield & Smith, 1976; Holmberg, 1980; Shields, 1978; Shugar, 1978). A review of this research is beyond the scope of this thesis. Interested readers may refer to individual studies above, a review by Rees, 1978; and to collected papers in Ervin-Tripp and Mitchell-Kernan (Eds.), Child discourse, 1977).

Research on negotiation of conversations by caretaker-child dyads is still in its infancy. Many researchers have commented on, and documented the differences between dyads and within dyads over time, in the types and patterns of strategies used by both participants (e.g., Brown, in press; Kaye & Charney, in press; Lieven, 1978; Rodgon, 1977; Snow, 1978; and Wells et al, 1979). There is a growing conviction among these researchers that the extent to which the dyads engage in successful interaction by maintaining mutual understanding and by developing the topic of conversation may have long-term consequences on the child's communicative skills.

SYNOPSIS OF CONCLUSIONS DERIVED FROM THE LITERATURE REVIEW

The following summary statements are derived from this review of the literature on interaction between primary caregiver and child.

1. The concept of what language is, and hence of what it is that children acquire, has changed during the past two decades from viewing language as structure to language as meaning. Children acquire knowledge of the use of language, as well as knowledge of its structure. Knowledge of language use includes knowledge of the different functions of language, and of strategies for keeping the meaning flowing in conversational interaction with different people in different settings. Hymes (1972) used the term 'communicative competence' to refer to this wide range of language knowledge (for review, see Rees, 1978; also Hymes, 1972; Grice, 1975; Gordon & Lakoff, 1975; Keenan & Schieffelin, 1976).
2. Children develop communicative competence in the context of, and through the process of interaction with responsive primary caregivers (for review; see McLean & Snyder-McLean, 1978; Rees, 1978; Waterson & Snow, 1978; also Brown, in press; Bruner, 1975; Halliday, 1975; Snow, 1978).
3. When primary caregiver and child interact, there is a two-way cause-effect relationship (e.g., Bruner, 1978; Lieven, 1978;

Moerk, 1977; Snow, 1978). Primary caregivers, as competent language users, act as primary language mediators and carry the major responsibility for the success of the interaction. They segment and mark verbally and non-verbally, various aspects of the interaction. They create communicative frameworks which are relevant to the child's non-verbal and verbal communicative strategies and cognitive processes. They monitor mutual understanding, repair communicative breakdown, and extend the topic of conversation (e.g., Bridges, 1979; Bruner, 1978; Kaye & Charney, in press; Moerk, 1976; Ninio and Bruner, 1978; Shugar, 1978; Snow, 1978).

4. Both child and primary caregiver rely heavily on contextual clues and on non-verbal communicative strategies such as intonation, gesture, facial expression for conveying and interpreting information (e.g., Bates, 1976; Bruner, 1978; Carter, 1978; Garnica, 1978; Gutmann and Turnure, 1979; Halliday, 1975; Messer, 1980; Murphy & Messer, 1977; Rodgon, 1979; Sachs, 1979).
5. The underlying motivating force for promoting the development of more standard and socially acceptable ways of communicating may lie in the successful repair of communication breakdown and the frequent attainment of communicative goals (Brown, in press; Cherry, 1979; Shields, 1978).

6. Primary caregivers vary in the extent to which they use various strategies and in the type of strategies used to facilitate turn-taking, interpret the children's utterances, maintain mutual understanding, repair breakdowns in communication, and extend the topic of conversation. There is growing evidence that these aspects of interaction are critical to the development of communicative competence (e.g., Cherry, 1979; Corsaro, 1977; Cross, 1978; Ervin-Tripp, 1978; Kaye & Charney, in press; Lieven, 1978; Mahoney, 1975; Rodgon, 1977; Snow, 1978; Wells, Montgomery and MacClure, 1979).
7. The extent to which the patterns of interaction between child and primary caregiver successfully maintain mutual understanding or repair communication breakdown and continue the conversation until communicative goals are reached, may have a major influence on the child's rate and level of development of communicative competence (Cherry, 1979; Cross, 1978; Lieven, 1978; Wells, Montgomery and MacClure, 1979).

CHAPTER V

APPROACHES TO LANGUAGE DEVELOPMENT IN THE FIELD OF MENTAL HANDICAP

Overview

Language skills of mentally handicapped individuals attracted little interest among researchers until the 1960's. At that time, the general increase in studies on language and language acquisition, and the interest in universals of language development in children, extended the research to include comparative studies involving mentally handicapped children. In the 1960's, the language of normal children was analyzed for syntactic constituents and rules in relative isolation of the context in which it was used. Hence, language studies in the field of mental handicap were dominated by descriptive comparisons of the syntax of normal and mentally handicapped individuals (for review, see Cromer, 1974; Sitko & Semmel, 1973; Yoder & Miller, 1972). The shifts in focus from syntax to semantics, cognitive prerequisites in the early 1970's, and finally to pragmatic aspects of language in the mid-1970's, evident in the field of normal language development, are reflected only minimally in the research on mentally handicapped individuals. Only a few isolated studies exist on the development of structural semantic relations (e.g., Coggins, 1978; Duchan & Erickson, 1976) on the relationship between language and cognitive development (for review, see Cummins, 1977; also Greenwald & Leonard, 1979) and on pragmatic aspects of language

such as the informativeness of lexical usage (e.g., Leonard & Cole, 1978), or the use of various strategies to initiate and maintain conversations (Bedrosian & Prutting, 1978; Berry & Marshall, 1978; Deveridge & Berry, 1977). Language study on mentally handicapped children has continued to lag behind the research on language in normal children, with the emphasis on syntax and comparative studies persisting well into the mid-1970's. Similarly, in comparison with the proliferation of observational studies of the linguistic environment of normal children, relatively few such studies with mentally handicapped children were revealed during an extensive literature search (the end sections of Tables A1-A5 in the Appendix). These studies will be reviewed in a following subsection.

As indicated above, the majority of studies have focused on the delayed or different issue (for reviews, see Cromer, 1974; Sitko and Semmel, 1973), working within the Reductionist or Interactionist Models (see Chapter II, p. 8). Most researchers have concluded that there are few differences in what normal and mentally handicapped children learn in terms of syntactic knowledge; the major difference lies in the slower rate of acquisition of syntax by the latter (e.g., Graham & Graham, 1971; Lackner, 1968; Lenneberg, Nicholas & Rosenberger, 1966; Yoder & Reichle, 1972). This conclusion also receives some support from the few studies on the development of semantic-structural relations

in mentally handicapped children (Coggins, 1979, Duchan & Erickson, 1976).

The possibility of differences in the process of language development is indicated in two different strands of literature. First, researchers investigating differential patterning of various language skills reported that mentally handicapped children demonstrate fewer significant intercorrelations between various verbal skills than do normal children (Lyle, 1961; Ryan, 1977). For example, Ryan (1977) reported that over a period of 14 months, mentally handicapped children continued to improve their scores on tests of recognition and production of noun vocabulary, whereas other aspects of their language, such as comprehension of syntactic constructions, remained static. At corresponding language levels (assessed by mean length of utterance), mentally handicapped children show a greater diversity of vocabulary (assessed by type-token-ratio), and use more main verbs, than normal children. Lower scores in other measures of syntax, such as use of secondary verbs, indefinite pronouns, and reversal of subject and copula in interrogatives, suggest that mentally handicapped children tend to produce syntactically less sophisticated sentences than their normal counterparts, matched for mean length of utterances (Rondal, 1977, 1978). Even when young children with Down's Syndrome and normal children are matched on developmental age, the Down's Syndrome children tend to differ in the type of strategies used to communicate their intentions, and in the patterns of interaction

with their mothers. They rely more heavily on gestures than their normal counterparts, who combined vocalisations with gestures (Greenwald & Leonard, 1979). They tend to smile, vocalise and talk less than normal children (Buckhalt et al, 1978; Marshall et al, 1973), but are also given less feedback from their mothers (Jones, 1977). They tend to initiate interactions less frequently than their matched counterparts, or alternatively they are given less opportunity to do so by their mothers (Jones, 1977). Mothers and mentally handicapped children tend to show poor use of turn-taking and mutual attention, but more asynchronous behaviour than normal mother-child dyads (Buckhalt et al, 1978; Jones, 1977; Kogan et al, 1969). Mutual attention and turn-taking are central to the development of communicative strategies (e.g., see Bruner, 1975). However, the problem of matching children on chronological age only, has frequently clouded the data (see discussion in Chapter III, p. 58).

Secondly, research on information processing and cognitive development indicates differences between normal and mentally handicapped children which, positing a relationship between cognitive and linguistic knowledge, may partly account for their differences and/or delay in language development. Mentally handicapped children show a tendency to attend to, and select irrelevant cues in structured learning tasks (Zeaman & House, 1963), and frequently fail to transfer and use available information supplied

by the examiner (e.g., Harter, 1967), or generated from previous learning trials (Fisher & Zeaman, 1973). They also tend not to use verbal labels spontaneously as mediation strategies to facilitate recall (e.g., Bryant, 1970). Although these were studies of learning strategies used in an experimental setting, it is possible that these strategies would also be applied in encoding and decoding verbal and non-verbal language. Other researchers have decumented irregularities, not only in the rate, but also in the pattern of development of Piategian cognitive stages (inhelder, 1968; Stephens et al, 1974; Wohlhueter & Sindberg, 1975). If there are cognitive precursors or prerequisites to language development, as postulated by researchers working within the interactional framework (refer to earlier discussion in Chapter II), then these irregularities in the pattern of cognitive development will be reflected in language development.

These differences in cognitive and communicative strategies used by mentally handicapped children, plus the prolonged period in which the same strategies may be used, are likely to have a major impact on the interaction between mother and child. Ryan (1977) proposed that it may be much more difficult for a parent to keep up the rich verbal interpretation of the child's utterances and extension of the child's topic (characteristics of middle class mother-child dyads), with a mentally handicapped child whose communicative attempts are unclear, repetitive, echoic and slow to develop, than with a normal child. Lieven's (1978)

description of breakdowns in communication during interaction with a normal child who did produce repetitive and uninformative utterances, gives support to this proposition.

Studies of the interaction between mothers and their mentally handicapped children will now be examined within the framework developed in the preceding chapter. Included in the discussion are methodological issues specific to the research with mentally handicapped individuals; however, those issues discussed in an earlier chapter (see Chapter III) are equally applicable to this field.

ADEQUACY OF THE EARLY LINGUISTIC ENVIRONMENT OF MENTALLY HANDICAPPED CHILDREN

Studies concerning the nature and role of the early linguistic environment of normal children stimulated interest in that of mentally handicapped children. The first studies investigated the modifications in adult speech addressed to school-aged institutionalized children (Siegel, 1963a, 1963b, c; Spradlin & Rosenberg, 1964). The researchers concluded that adults adjust the structural complexity of their speech to the verbal ability of mentally handicapped children. No measures of adult-adult speech were taken, and no comparison groups were studied, so that conclusion is questionable.

Three initial studies compared mothers' speech to preschool-aged, normal and home-reared, mentally handicapped children, matched

for chronological age (Buium, Runders & Turnure, 1974; Kogan, Wimburger & Bobbitt, 1969; Marshall, Hegrenes & Goldstein, 1973). The data indicated that mothers of mentally handicapped children provide a different verbal environment for their children, than mothers of non-handicapped children (see Table 9).

Table 9: Characteristics of Maternal Language Addressed to Mentally Handicapped Children in Comparison with that Addressed to CA-Matched Normal Children.[a]

Maternal Language	Researchers
Greater frequency of controlling behaviours such as commands, demands, requests, etc.	Kogan et al, 1969 Marshall et al, 1973 Buium et al, 1974
Greater number of utterances, but shorter mean length of utterances.	Buium et al, 1974
More grammatically incomplete sentences and single word responses.	Buium et al, 1974
More questions to which they supply the answer or to which the child already knows the answer (test questions).	Kogan et al, 1969
Fewer conjunctions, indefinite pronouns, and wh-type questions (where, when, what, who, which or how).	Buium et al, 1974

Note: [a] All studies were carried out in a laboratory setting.

Interpretation of the data gave rise to the hypothesis that the different, and possibly deficient early linguistic environment of mentally handicapped children, may partly account for their later language problems (De Villiers & De Villiers, 1978; Dolley, 1974; Buium et al, 1974; Mahoney, 1975; Mitchell, 1976). However, many methodological problems exist in these three studies, which have clouded the data.

One variable, which is particularly relevant to the field of mental handicap, is that of etiology. Frequently, in comparative studies, normal children are compared to a group of mentally handicapped children with various etiologies (e.g., Marshall et al, 1973). Similarly, a group of Down's Syndrome children may be compared to another mixed group of mentally handicapped children who do not have Down's Syndrome, but whose mental handicap is of various etiologies. Differentiation by etiological groups may be indicated for research, as there is some evidence that different subgroups of mentally handicapped individuals exhibit different problems in language and cognitive development (e.g., Wohlhueter & Sindberg, 1975; see review by Cromer, 1974). However, forming homogeneous groups on the basis of etiology has several associated problems. There is wide variation in etiology. Although Richards (1970) listed 27 conditions which are diagnosable from medical history and clinical examination, in many instances, an equivocal diagnosis cannot be made. Secondly, there are often difficulties

in obtaining a large enough sample of some of these subgroups to make meaningful comparisons. Thus, many researchers select children with Down's Syndrome as sufficient numbers of such children are readily available, and secondly, with this group, there is usually an early and unequivocal diagnosis of the syndrome and the associated mental handicap. This second factor relating to the time of diagnosis is important as it allows researchers to control for the length of time that the individual has been perceived by parents and others as being mentally handicapped. Other mentally handicapped children may not be diagnosed until preschool or school-age. Parents' perceptions and expectations of children with Down's Syndrome, and children with a later-diagnosed mentally handicapping condition, may not be comparable.

Another issue related to matching is that of matching for age or language level.[9] Matching on the basis of just one of three variables, chronological age, developmental age or language level, cannot control for the intruding effects of the other two variables.

The use of chronological age matching as a basis for the studies has been strongly criticised by Rondal (1977). Normal and mentally handicapped children of the same chronological age will

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[9] This issue has already been addressed in Chapter III, and by Buckhalt et al, 1978, and Rondal, 1976.

be at different levels of speech and language functioning. Previous studies have shown that the modifications in maternal speech change with the increasing communicative competence of the child (Bridges, 1979; Cross, 1977; Moerk, 1974, 1976; Newport, 1976; Ninio & Bruner, 1978; Snow, 1977). Thus, it is not possible to distinguish between the effects of level of speech and language development in the studies of Buium (1974), Kogan (1969), and Marshall (1973). Buium (1974), did not measure the children's language level.

Rondal (1976) avoided the confounding problem of chronological age matching, by matching on the basis of language level, assessed by the mean length of utterance (M.L.U.) using Brown's criteria (1973). Children with Down's Syndrome and normal children were matched and evenly distributed between three M.L.U. levels. The chronological age range of the children, however, varied greatly. Normal children were between the ages of 20 and 30 months, whereas those with Down's Syndrome ranged from 3 to 12 years! Although the children were matched for language level, their experience with language was hardly comparable. No indication was given of the mental ages of the children. Mothers were matched for socioeconomic status, ethnic group, intelligence, educational level, and all spoke English as their first language. The study was carried out in the home using a free-play situation. Eight measures of the children's speech were analyzed to validate the use of M.L.U.-matching for the study. These related to frequency counts, syntactic and

semantic features, sentence types, and echoic responses. There were no significant differences in the structural aspects of speech of normal and mentally handicapped children matched for M.L.U., but there were significant differences between the children's speech at different language levels. The use of M.L.U. matching as a basis for the study was thus validated.

Twenty parameters of maternal speech were analyzed, including output-frequency counts, syntactic and semantic features, sentence types and frequency of acceptance and correction of the child's response. Many of these parameters were similar to those measured by Buium (1974). Structural aspects of maternal speech addressed to the Down's Syndrome children and normal children were similar at corresponding M.L.U. levels. There were, however, differences in structural aspects of maternal speech according to the language level of the child, but not type of child.

O'Kelly-Collard (1978) investigated differences in maternal language addressed to Down's Syndrome children and normal children, matched for both mental age and language stage.[10] Furthermore, the range in chronological ages was much smaller than the range in Rondal's study.[11] Both structured and unstructured situations were

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[10] Language stage was measured by the Reynell Language Scale which gives both receptive and expressive language scores.

[11] Chronological age range of children observed by:

Rondal (1976)	Down's Syndrome	3-12 years
	Controls	20-32 months
O'Kelly-Collard (1978)	Down's Syndrome	22-54 months
	Controls	16-20 months

used to analyze 38 measures of maternal language, which included syntactic features, a few discourse features, and functional parameters such as commanding and requesting information. Only two out of the 38 measures differentiated the two groups; mothers of mentally handicapped children used a higher proportion of declaratives and a lower proportion of exact repetitions than mothers of normal children. Neither measure was thought to have a profound effect on the child's language development.

Three other studies (Buckhalt et al, 1978; Jones, 1977; Vietze, 1978) investigated the hypothesis that in comparison with the linguistic environment of non-handicapped children, that of mentally handicapped children is different and possibly inadequate for promoting the child's communicative skills. The analysis in these studies focused primarily on non-verbal behaviour such as mutual attention, and on turn-taking.

Buckhalt et al (1978) observed the interaction between one-year-old Down's Syndrome children and their mothers. A comparison was made with the interaction of one-year-old normal children and their mothers. Although the children were matched on chronological age, in addition their mental age was estimated on a standard developmental test. Mothers were matched for age, culture and socioeconomic class. The mutual responsiveness of mother and child was assessed by measuring the frequency with which each smiled, vocalised, touched and looked at the other. The complexity of maternal language was measured only by maternal mean

length of utterance. Differences in maternal behaviour were related primarily to developmental age, rather than to diagnosis of Down's Syndrome. The frequency of mothers' vocalisations was correlated positively with both chronological and mental age in the normal group, but only with mental age in the Down's Syndrome group. In other words, mothers talked more to the developmentally more competent babies within groups, than to developmentally younger ones. However, Down's Syndrome infants were less responsive than non-handicapped infants, as indicated by their lower frequency of smiling and vocalising. In addition, observations suggested that the vocalisations of Down's Syndrome babies were more asynchronous to maternal behaviour than those of normal babies: no analysis was performed. A similar disturbance in turn-taking in the interaction between mothers and older mentally handicapped children (3-7 years) was reported by Kogan et al (1969). They commented that:

> ..... retardates and their mothers 'did nothing together' more often than other things while comparison children and their mothers took turns.
>
> (Kogan et al, 1969, p. 807.)

Disturbances in turn-taking between mothers and Down's Syndrome children were also reported by Jones (1977). Even when matched on developmental age, in relation to mothers and normal children, Down's Syndrome children and their mothers show poor use of turn-taking, by frequently vocalising simultaneously. Down's

Syndrome children tended not to initiate sequences as frequently as normal children, and in some dyads, they were not given as much opportunity to do so. Mothers of Down's Syndrome children tended to receive fewer appropriate responses to their initiations, but also tended to provide less feedback to their children's responses, in relation to mothers of normal children.

Patterns of vocalisation between mothers and developmentally delayed infants were examined by Vietze et al (1978). The infants had various handicaps including Down's Syndrome, visual impairment, and motor handicaps. A comparison was made with patterns between mothers and normal infants. It is not clear on what basis the comparison was made as the children differed in both developmental and chronological levels.[12] Vietze et al (1978) reported that the rate of vocalisation of developmentally delayed infants resembled that of normal infants at 12 months, whereas the rate of vocalisation of mothers of delayed infants resembled that of

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[12] Developmentally delayed infants: two groups were formed on the basis of developmental level estimated by Bayley Scales of Infant Development. Higher functioning groups had developmental scores between 50 and 74, and mean chronological age of 18 months. Lower functioning children had developmental scores of below 50, and mean chronological age of 28 months.

Non-delayed infants: Developmental scores above 100. Data were taken when infants were 2½, 6½ and 12 months old.

mothers of normal infants at 2½ months. The conclusions are questionable, but the study did demonstrate a methodology for studying the sequencing and duration of mother and infant behaviours.

SUMMARY AND IMPLICATIONS FOR RESEARCH

The linguistic environment of mentally handicapped children has received little attention in relation to that of normal children (compare main section and end section of Tables A1-A5, in the Appendix). The majority of these observational studies of mothers and mentally handicapped children have addressed the issue concerning the adequacy of the children's linguistic environment in relation to that of normal children. Non-comparative observational studies of interaction between caregivers and mentally handicapped children are rare (notable exceptions are: Cheseldine & McConkey, 1979; Mitchell, 1980).

The analyses have focused primarily on the structural aspects of maternal speech, modelling the type of measures used in analyses of interaction between mothers and normal children. A few researchers (Buckhalt et al, 1978; Kogan et al, 1969; Jones, 1977; Vietze, 1978) have analyzed the organisational aspects of interaction, such as turn-taking and mutual attention. One researcher (Mitchell, 1980) has developed a technique for examining the contingencies between verbal and non-verbal features of the communicative behaviour of parents and children.[13]

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[13] This material was received just prior to the submission of this thesis, and hence has not been discussed with the detail it deserves.

The controversy surrounding the nature of the linguistic environment of mentally handicapped children in relation to that of non-handicapped children, has yet to be resolved. Buckhalt et al, (1978), O'Kelly-Collard (1978) and Rondal (1976) have challenged the earlier proposition that mentally handicapped children are exposed to a different and possibly deficient early linguistic environment. Rondal (1976) concluded that mentally handicapped children must be receiving a linguistic input which is as appropriate and as adequate as that received by normal children of similar abilities. There is some evidence of differences in the organisation of interactions (e.g., assessed by turn-taking and synchronicity of behaviour) and in the consequent events of communicative attempts of both mother and child (e.g., Buckhalt et al, 1978; Jones, 1977; Kogan et al, 1969). In addition, the fact still remains that mentally handicapped children not only acquire communicative skills at a slower rate than do normal children, but that this rate is often slower than may be expected from the children's mental age measures (Cromer, 1974; Mittler and Berry, 1977).

The data from a different strand of the literature, that of language intervention studies, are pertinent to this discussion. Several pilot intervention studies, involving mothers and mentally handicapped children, have effected changes in the parents' supposedly "appropriate" language strategies, which have resulted in corresponding improvements in the children's language

(Cheseldine & McConky, 1979; McDonald et al, 1974; Seitz & Hoekenga, 1974). Cheseldine & McConky (1979) concluded that "mentally handicapped children apparently need more than an adequate linguistic input" (p. 618). Changes were effected in parents' interaction style by training parents when and how to use specific language-teaching strategies (McDonald, Blott et al, 1974), by modelling appropriate strategies with accompanying discussion and information-giving sessions (Cheseldine & McConkey, 1979; Seitz & Hoekenga, 1974), or by simply giving parents specific and appropriate language objectives for their children (Cheseldine & McConkey, 1979). The objectives of these pilot intervention studies were to obtain structural changes in the children's expressive language by increasing the children's mean length of utterance and/or by increasing the grammatical complexity of their utterances.

In general, the strategies modelled by clinicians for parents, and those spontaneously adopted by parents, tended to facilitate the initiation and continuation of conversations by encouraging the child to become an active and innovative participant in the interaction. For example, parents tended to pause for, and to respond more frequently to the child's utterances, and to describe the child's ongoing activity (e.g., Cheseldine & McConkey, 1979; Seitz & Hoekenga, 1974). These changes, in fact, reflect changes in patterns of interaction, rather than changes in the structure of parental speech. In addition, these "successful" strategies

and patterns of interaction used by mothers during interaction with their mentally handicapped children, are similar to the strategies used by mothers and normal children, which were good predictors of the child's linguistic growth (see Table 8, Chapter IV). This strongly suggests that the framework derived from the integration of data from studies of normal children is relevant to research in the field of mental handicap. The implications for future research in this field are clear: analyses should focus on the mutual adaptation in conversations between mothers and mentally handicapped children, and on the children's development of conversational skills parallelling or extending the ongoing research with normal children. This research may then provide further insight for language intervention programmes, on facilitating patterns of interaction which advance the child's communicative skills.

Increasing demands for language intervention programmes indicate the need for effective programmes in terms of cost, time and number of professionals required, as well as in terms of goal-achievement. Cheseldine and McConkey (1979) demonstrated that not all parents and children require an intensive and intrusive programme in order to achieve the language objectives. The key issue is how to determine which parents and children require a more structured and intensive programme, and which need just a counselling supportive approach. Further research is required to develop simple screening tools to predict with reasonable reliability "at-risk"

patterns of inteaction which may impede the child's development of communicative skills. The relevance of the framework, developed in this thesis, for language intervention programmes will be discussed in the final chapter.

CHAPTER VI

IMPLICATIONS FOR LANGUAGE INTERVENTION PROGRAMMES

Issues in Language Training Programmes

In the United States of America, the Public Law 94-142 enacted November 1975 as the Education for All Handicapped Children Act, proclaimed the nation's commitment to provide and fund educational services for all handicapped children. Education in Canada is a provincial responsibility which makes it unlikely that there will be any national policies for the education of exceptional children. Despite the CELDIC report (Roberts et al, 1970), which documented the size of the population in need of additional health and educational services, and the SEEC report (1971), which described the inadequacies of existing services, only three provinces (Manitoba, Nova Scotia and Saskatchewan) have passed mandatory special education legislation to provide funds and services for education of the handicapped.[14] In view of the high incidence of language disorders among mentally handicapped individuals (Jordan, 1967), these national and provincial commitments to provide educational services, have increased the demands for language intervention programmes and the standards of accountability for these programmes. Two major issues have arisen which relate to the development of language programmes and to the assessment of their

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[14] In Ontario, legislation is still pending. Other provinces do provide many services.

efficacy; namely what to teach and how to teach the objectives.

The review of the literature presented in this thesis points to the following major changes in hypotheses which have occurred during the 1970's.

1. Linguistic theory and research are no longer dominated by the Reductionist model in which language is viewed as a system of structures and rules for their combination. The emerging concept of language as a system of communication and meaning which is context-bound, is consistent with the assumptions of the Unified model (see Chapter II).
2. The goal of a language-learning child is to develop competence in appropriate and effective use of language in context (communicative competence: Hymes, 1972), as well as competence in the knowledge of linguistic rules and structures (linguistic competence: Chomsky, 1957).
3. The child develops communicative competence through the process of dynamic reciprocal interaction with responsive primary caregivers.
4. The interaction process demands mutual responsiveness and adaptation between caregiver and child. Caregivers, as more competent in both use of language and knowledge of linguistic rules than the child, carry the major

responsibility for the success of any interaction with the child.

5. The focus of responsibility for the child's development of language has thus shifted from the child as in Chomsky's (1957) theory, and from the environment as in Skinner's (1957) theory, to the process of interaction, and mutual adaptation between child and primary caregivers.

These hypotheses are pertinent to issues concerning the content and teaching procedures used in language intervention programmes. Thus, the framework derived in this thesis will be applied in the following discussion on recommended changes in content and procedure.

A wide range of both formal published language programmes and experimental training protocols are available (for reviews, see McLean and Snyder-McLean, 1978; Schiefelbusch and Lloyd, 1974; Snyder, Lovitt and Smith, 1975), but many appear incompatible in terms of their divergent theoretical bases, and hence in their training objectives and procedures. Although theory and practice are often thought to be mutually exclusive worlds, in the area of language training the content and procedures selected, generally reflect the researcher's views of the nature of language and of language acquisition (McLean and Snyder-McLean, 1978; Ruder and Smith, 1974). Thus, the majority of programmes were spawned from

the two prevalent and polarised theories of Skinner (1957) and Chomsky (1957). Some programmes have incorporated concepts from the more recent cognitive-semantic model of language development (e.g., Bricker and Bricker, 1974).

Essentially, the Skinnerian model of language development provides the researcher with descriptions of the procedures by which language may be learned, but provides little help in conceptualising what is learned and in what sequence. The Chomskian model, conversely, provides details of the form of the products of language development, but not of the processes by which these forms may be learned. The cognitive-semantic model of language development describes the constraints placed upon language development in terms of the prerequisite cognitive structures which must be attained, but not the necessary conditions to stimulate their acquisition. Hence many of the formal language programmes have applied the principles of Skinner's learning theory to teach a content based on an adult system of syntax derived from the work of Chomsky (e.g., Guess, Sailor and Baer, 1974; Kent, 1974; Sloane and MacAulay, 1968; Carrier, 1975). Others have attempted to integrate theories of cognitive and linguistic development with operant methodology (e.g., Bricker and Bricker, 1974; Miller and Yoder, 1974; MacDonald, 1976). Most of the underlying theory of a language programme will stress just one aspect of language such as syntax, semantics or pragmatics, and this element will form the

target goal (see McLean & Snyder-McLean, 1978, for discussion of specific foci of formal language programmes).

The combination of developmental theory with learning theory in one programme appears incompatible, in that developmental models imply inherent hierarchies of skills which are acquired at certain levels of maturation and that attainment of one skill is prerequisite to the attainment of another. In contrast, learning theories assume that skills may be taught specifically in any sequence independent of maturational levels (Turton, 1974). Although the use of operant techniques has been claimed to be successful in establishing a verbal repertoire in some previously non-verbal children (Garcia and De Haven, 1974; Snyder, Lovitt and Smith, 1975), generalisation of the trained behaviour to other situations has tended to be very limited. Yoder and Reichle commented:

> Our problem was not to be found in teaching mentally retarded children to perform... but was to have the children use the forms we taught at an appropriate time, in an appropriate setting with appropriate individuals.
>
> (Yoder and Reichle, 1977, p. 199.)

In other words, the children were acquiring knowledge of linguistic structure, but not of the appropriate use of these structures. This latter type of knowledge is central in Hymes' (1972) concept of

communicative competence.

Several recommendations for changes in both the content and the procedures used in language programmes are appearing with increasing frequency in the literature. These recommendations are presumably in response to both the problems in establishing functional use of the learned linguistic structures, and to the recent shift in child language research from conceptualising language as structure to language as meaning.

RECOMMENDED CHANGE IN CONTENT: DISCUSSION

Two recommendations have been made which refer to the change in data base for the content and to the order in which the content should be taught:

1. "The content for language training for the retarded should be taken from the data available on language development in normal children."

(Miller and Yoder, 1972)

2. "If we are to develop functional communication systems for the mentally retarded person we must focus on the functions of communication."

(Yoder and Reichle, 1977)

Interpretation and evaluation of these recommendations and the arguments of their disputants must take into account both the

typical characteristics of clientele of language-training programmes and the nature of the available data at the time the recommendations were made.

Miller and Yoder (1972) had advocated that not only should the content be derived from data on language of normal children, but also that it be taught in the same sequence as evidenced in normal children. Their claim was strongly disputed by Gray and Ryan (1973) and by Guess, Sailor and Baer (1974) who all argued that there was insufficient empirical evidence on developmental progression to justify following a specific order. They commented that although linguists had documented typical sequences of acquisition of linguistic structures, they had not determined whether a particular set of linguistic skills served as pre-requisite to the acquisition of other linguistic skills. In addition, Guess, Sailor and Baer (1974) argued that developmental data are not relevant because frequently the children being taught are not young normal children, but are older mentally handicapped children, and almost by definition language-training programmes serve those whose development has already deviated from the norm and in whom the normal acquisition process has not occurred.

Two marked changes have occurred since these arguments were voiced. First of all, at that time, there were data on the products of language development in terms of syntax and semantics, and on the developmental progression characteristic of the normal

process of acquisition (e.g., Bloom, 1970; Bowerman, 1973; Brown, 1973), but not on the process of development. The arguments predated much of the data on cognitive processes and constraints in language development on pragmatics such as the communicative functions of language, conversational skills, and the role of context in communication, and on the process of language development.

Thus, at the time it was made, this recommendation could only refer to teaching language structure, unit by unit, following the typical sequence of acquisition observed in normal children. With this interpretation, its rejection is justified and inevitable. A task such as this would be impractical if not impossible, and this approach has already been shown to be ineffective in achieving functional use of the structures in contexts other than the one in which the structures were taught. An interpretation made in 1980, based on current data, brings it in line with the recommendations made by Yoder and Reichle (1977), and others (Mittler and Berry, 1977; McLean and Snyder-McLean, 1978; Rees, 1978) to focus first on the functions of language, rather than on the structure.

Data from extensive research on the communication between mother and child indicate that children develop communicative functions of language prior to the acquisition of its structure. Children initially express their communicative intention by non-verbal means, and only later do they map the verbal code onto these well-established non-verbal communicative strategies (e.g., Bates,

1976; Bruner, 1975, 1978; Dore, 1973; Halliday, 1975). These early non-verbal communicative strategies such as the establishment of mutual attention, joint action and turn-taking while reaching, giving, showing, pointing and vocalising, form the basis of communication and should well be the initial target behaviours for language programmes (Yoder & Reichle, 1977). The role of interaction with primary caregivers in developing these strategies is more relevant to the discussion on procedures and will be referred to in that section.

As many language-training programmes must cater for young as well as older mentally handicapped children who are chronologically and/or developmentally at the infant, toddler, or preschool age, an initial focus on these critical strategies appears to be fully justified. Grammatical training may be more appropriately placed later in the language training curriculum, reserved until the child has established a system of verbal and/or non-verbal communication with others (Yoder and Reichle, 1977; Mahoney, 1975; McLean and Snyder-McLean, 1978).

There is growing evidence that these non-verbal communicative strategies are prerequisite to the development of verbal strategies, and thus the sequence should be based not on the developmental progressions in the forms of language, but rather on progressions in the strategies used by normal children.

RECOMMENDED CHANGE IN PROCEDURES: DISCUSSION

Knowledge of the nature of the content to teach is not synonymous with knowledge of effective procedures for teaching it. Most language-training programmes depend on operant principles of behaviour modification as a model for teaching procedures. While these procedures have been effective in establishing expressive speech in some children, they have not been very effective in establishing functional use of the learned skills in other settings (e.g., Yoder and Reichle, 1977). As noted in the preceding discussion, the focus on language structure appears to be a misfocus in light of current data. Thus, the selection of a content based on language structure rather than on language function, may be partly responsible for problems in achieving generalisation. Few specific suggestions have been reported on how to most effectively teach communicative skills. There is clearly a need in research for the design and implementation of additional teaching strategies which promote the development of communicative competence.

Mahoney (1975) basing his recommendation on available data on the interactional context and process of language development in normal children, proposed that the basic intervention strategy would:

> ... involve training the models to synchronise their communication strategies with those of the children

> so that there would be a relatively efficient preverbal or non-verbal communication system between them. Once the models had established efficient communication with the children, then the role of the models would be to stress this communication network by gradually enriching and developing the children's preverbal system into a linguistic system.
>
> (Mahoney, 1975, p. 145)

Mahoney (1975) uses the term 'models' to refer to the child's primary caregivers who, in fact, serve as the child's primary language models or language mediators. Three major changes in procedures are called for in his recommendations. First, he advocates changing the setting of the training programme from a clinical setting to the child's primary social environment. In many programmes using a clinical setting, the training session is scheduled for a set period of time. Mahoney (1975) in essence is advocating the abandonment of these isolated sessions and recommends following the typical pattern of brief and frequent interactions which occur spontaneously between primary caregiver and child during daily activities.

Secondly, he recommends training the child's primary language mediator to follow the child's interests and to interpret and respond to the child's non-verbal communicative attempts, thus

considering the child's cognitive processes. Only once this non-verbal communication system is established does he advocate stressing a verbal system. These procedures stand in direct contrast with those used in many training programmes, where the teacher/clinician assumes the role of language mediator, thus training the child directly. Generally, emphasis is placed immediately on the verbal mode of communication, in that the child is trained to interpret and respond to the mediator's verbal demands. The teacher/clinician is rarely able to spend sufficient time with the child to share experiences or to know what interests the child or how the child generally expresses different communicative intentions. Thus, the body of information and presuppositions that the child and teacher/clinician share may be very limited. Mahoney (1975, p. 145) referring to shared information and presuppositions, commented that "the extent to which children and their language models can communicate with each other is constrained by this dimension more than any other".

The third recommendation was to pattern the reinforcement procedures on the type and system of reinforcement used by primary caregivers in the natural home environment. In many language-training programmes, the child is reinforced for the production of a particular linguistic structure, with either primary reinforcers such as food or water, or with conditioned reinforcers such as candy, toys or tokens. Long-term use of these

reinforcers may render them ineffective, in that the child learns to produce language to procure candy rather than to sustain interaction and to achieve a communicative goal. Thus, this reinforcement procedure may serve to terminate conversation rather than sustain it as intended (Mahoney, 1975). Natural reinforcers such as the appropriate outcome in response to a request, not only are used less frequently and more subtly than those in language programmes, but also they tend to be used in response to the inferred communicative intention of the child rather than in response to the grammatical correctness of the surface structure of the child's utterance (e.g., Nelson, 1973).

Earlier in this section, it was proposed that the content and procedures used in any language programme tend to reflect both the concepts concerning the nature of language and the theory or approach to language development upheld by its designer(s). The recommendations for change in content and procedure presented above are all derived from data which are being integrated and formulated into the emerging Transactional approach, and are consistent with the constructs of the Unified model. Thus, these recommendations are, in fact, recommendations for a change and a consistency in the theoretical base of programmes.

The integration of data from observational studies of the interaction between language-learning children and primary caregivers, presented in this thesis, provides some support for these recommended

changes in language intervention programmes. Full justification, however, must wait for their implementation in any one programme and for an assessment of the effectiveness of such a programme first in terms of achieving functional and appropriate use of language, and secondly in terms of dollars, manpower and time.

APPENDIX

KEY TO TABLES A1-A5

Investigators have employed well over 100 different measures in the analysis of adult speech to young children, in approximately 95 different studies from 1969 to early 1980. The majority of these dependent variables and the independent variables are summarised in Tables A1-A5. The abbreviations used in the tables are described below, followed by a brief explanation of how to read the tables.

ABBREVIATIONS

Independent Variables

A-A/A-C	Comparison of speech between adults with speech between adult and child.
M-C/F-C	Comparison of mother's speech to child, and father's speech to child.
C-C	Conversation between children.
SES	Comparison of speech of adults from different socioeconomic classes.
DS	Down's Syndrome.
MH	Mental Handicap.
DD	Developmentally Delayed.
FP	Free-play situation, but with varied conditions. Children may play with own toys, or with the range of toys in laboratory playroom, or with small number of toys provided by researcher.
S	Structured situation. Adults instructed to teach child how to perform certain tasks.
ST	Includes talking about pictures in books and reading stories.
I	Researcher interviews adult.
Q	Use of questionnaire.
C	Caretaking during daily activities such as feeding, bathing, dressing.

H	Home setting.
L	Playroom in university laboratory or clinical setting.
S	Nursing school or daycare.
3→12 (age range)	Indicates longitudinal desing, e.g., children followed from 3 months→12 months.
3-12	Indicates cross-sectional design and age range of children.
1,2,3 years	Cross-sectional design. Children grouped into these age levels.

Dependent Variables (Measures used to analyze caretaker speech)

M.L.U.	Mean Length of Utterance.
T.T.R.	Type Token Ratio, a measure of the diversity of vocabulary.
X	Indicates that the feature was analyzed or was recorded and described by the researchers. Where there are different definitions of a measure (e.g., see Table A1 under M.L.U.), the symbol indicates which definition was used.
—	Indicates the feature was not recorded or analyzed.

Reading the Tables

The studies are arranged in chronological order, with the exception of studies of mentally handicapped children and their mothers. These latter studies are grouped chronologically in the end section of each table. The various features of conversations between adults and children have been grouped into broad categories as follows:

- Syntactic characteristics (Table A1).
- Sentence types and forms of conversational strategies (Table A2).
- Topics or referents and function of conversational strategies (Table A3).
- Organisation of conversations: turn-taking, breakdown and repairs (Table A4).
- Non-verbal strategies: prosodic features and gestures (Table A5).

Within each table, the measures used to analyze each category are listed across the top of the table.

The range of features of adult-child conversation investigated in any one study may be found by scanning all 5 tables for that particular study. For example, Parker, 1976, appears only in Table A5, as her analysis focused on gestures. Cross, 1977, is to be found in all tables as the measures used in this study covered a broad range of features of the structure and the topics of

maternal conversations.

The frequency with which any particular feature of adult speech has been analysed, may be estimated by looking down the column(s) under that feature and summating the number of X-symbols. Where there are different definitions given for a particular feature, then the relative frequency of use of each definition may be found. For example, in Table A1, the mean length of utterance (M.L.U.) has been assessed in terms of words in 15 studies and in morphemes in 10 studies. The 15 studies, assessing M.L.U. in terms of words, varied in design and in which variables were controlled. Design features such as age range of children, setting and situation, are summarised in the columns under the heading "Independent Variables". To find the conditions under which the feature was analysed, these right-hand columns should be scanned. For example, in the case of M.L.U., only 5 out of the 15 studies measuring M.L.U. in words, assessed maternal sentence length in the natural home setting.

These are just a few suggestions for using the tables. The presentation of the tables was designed to summarise as much information from as many studies as possible, in order to provide a comprehensive summary of this body of research.

TABLE A1: SYNTACTIC CHARACTERISTICS OF MATERNAL SPEECH TO YOUNG CHILDREN

RESEARCHERS		GENERAL MEASURES OF STRUCTURAL COMPLEXITY										SPECIAL MEASURES OF STRUCTURAL COMPLEXITY																								INDEPENDENT VARIABLES				
		M.L.U.				RATE		AMOUNT		T.T.R.																														
		Words	Morphemes	Utterances of Specific Length	Difference Between Child and Mother's M.L.U.	Words per Minute	Utterances per Minute	Total Words per Study	Total Utterances per Study	Carroll Type	Total Words Spelled Differently/ Total Words	Complete Sentences	Grammatically Incorrect	Sentence Fragments/Interjections	Single Word Utterance	Propositional Complexity (S-Nodes)	Sentence Complexity Index	Preverb Length	Verb Types	Verb-Tense	Pronouns	3rd Person Pronoun	Adjectives	Modifiers	Conjunctions	Other Morphemes (Negatives, Prepositions Plurals, Possessives)	Content, Function Words	Deletions	Specific Variables Examined or Special Characteristics of Dyad(s)	Sample Size (Given in Dyads)	Age Range of Children (in months)	Situation	Setting
DRACH	1969	-	X	-	-	X	-	-	X	X	-	-	-	-	-	-	X	-	-	-	-	X	-	X	X	-	X	A-A/A-C; Black	1	26	?	?
PFUDERER	1969	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	24-36	FP	H
BROEN	1972	X	-	-	-	X	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A-A/A-C;Age Situation	10	18-26 4-6yr	FP ST	L
SACHS et al	1972	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	Non-Parents 1 Child	5	22	S	L
SNOW	1972	X	-	-	-	-	-	X	-	-	-	-	X	-	-	-	X	X	-	-	-	X	-	-	-	-	X	-	-	A-A/A-C; Task Difficulty; Mother/Non-Mother; Child Presence	36	2-3yr 9-12yr	S ST	L
NELSON	1973	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	12-25	FP S	H
PHILLIPS	1973	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	X	-	X	-	-	-	X	-	-	-	X	-	A-A/A-C;Sex	39	9,18,28	FP	L
FRASER, ROBERTS	1975	X	-	-	-	X	-	X	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	Sex Age;Sex; Situation	32	18-30 4-6yr	S ST	L
GLEASON	1975	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M-C/F-C	134	?	?	L
LONGHURST et al	1975	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age	36	1,2,3yr	FP	L
CHERRY & LEWIS	1976	-	X	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sex	38	21	FP	L
NEWPORT	1976	?	-	-	-	-	-	-	-	-	-	X	X	X	-	?	-	-	-	X	-	-	X	-	-	-	X	X	-	A-A/A-C;Age Language Level	15	12-15 18-31 24-27	FP I	H
REMICK	1976	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	?	-	-	-	-	-	-	-	-	-	?	A-A/A-C/Age Individual Data	Po	17-30	FP I	H
SNOW et al	1976	?	-	X	-	-	-	-	-	-	-	-	-	-	-	?	-	?	?	?	?	?	-	-	X	-	?	Culture (Dutch); Class; Situation	18	18-30	FP ST	L
WEISTRAUB	1976	X	-	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M-C/F-C	120			L
CROSS	1977	-	X	X	X	X	-	-	-	-	-	X	X	-	X	?	-	X	-	-	X	-	-	-	-	-	-	-	?	Age; Language Level	14	19-32	FP	H
HARKNESS	1977	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	?	-	-	-	-	-	-	-	-	-	-	-	-	Culture (Kenya)	P	24-12	FP	H
PINGLER	1977	X	-	-	X	X	-	-	-	-	X	?	-	?	-	-	-	-	?	-	-	-	-	-	-	-	-	?	-	A-A/A-C;Age; Black, Working Class	10	18-22 19-25	S I	L
NEMES	1978	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age; Language Level	78	12-16-20	FP	L
LIEVEN	1978	-	?	-	-	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age; Language Level	3	17-24 18-25 19-26	FP	H
FURROW et al	1979	X	-	-	X	-	-	X	-	-	-	-	-	X	-	X	-	-	X	X	-	-	X	-	X	-	X	-	-	Age; Language Level	7	18-27	FP	H
KOLNIKOFF, et al	1979	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	?	-	-	-	-	-	-	-	-	-	-	-	-	Situation; Sex; M-C/F-C	24	19	FP S Q	L
BUIUM et al	1974	-	X	-	-	X	-	X	X	-	X	-	X	-	X	-	-	-	X	X	X	-	-	-	X	-	-	-	-	Down's Syndrome/CA Normal; Situation DS/N	11	DS:24 N:24	FP S	L
FINDAL	1976	-	X	X	-	-	-	X	-	-	?	?	X	-	-	-	?	X	?	?	-	-	-	X	-	-	-	-	-	DS/N	42	DS:1-12/ N:20-32	FP	H
FUCHALT, et al	1979	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DS/N; Situation	20	DS:9-17 N: 9-18	FP S	L
O'KELLEY-COLLAPO	1976	X	-	X	-	?	-	-	X	-	-	?	X	-	?	?	-	X	-	-	-	-	-	-	-	-	-	-	-	DS/N; Situation	12	DS:22-54 N: 18-70	FP S	L
CHESELDINE et al	1979	-	X	-	-	-	X	X	-	-	?	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DS Parental Style	X	DS:4½-6yr	FP	H
GUNN et al	1980	X	-	-	-	-	?	-	X	-	-	-	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DS; Toys/ No Toys; Age	X	DS:4-11	FP	H

TABLE A2: STRUCTURAL FORM OF MATERNAL CONVERSATIONAL STRATEGIES AND SENTENCE TYPES

RESEARCHERS		SURFACE SENTENCE TYPES							FORM OF CONVERSATIONAL STRATEGY												INDEPENDENT VARIABLES				
									SELF-REPETITION					REPETITION OF CHILD'S UTTERANCE						RELATION TO PRECEDING UTTERANCE					
														IMITATION			EXPANSION			EXTENSION								
		Questions	WH-	Yes/No	Tag	Imperatives	Declaratives	Deictic Statements	Percent of Utterances (Mother's)	Exact	Partial	Transformed	Paraphrased	Percent of Utterances (Mother's)	Exact	Partial	Percent of Utterances (Mother's)	Percent of Child's Utterances Expanded by Mother		Percent of Utterances	Simple	Complex	Immediately Following	Within (?) Number of Utterances	Specific Variables Examined, or Special Characteristics of Dyad	Sample Size (in Dyads)	Age Range of Children (in Months, unless stated otherwise)	Situation	Setting
BRACH	1969	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A-A/A-C;Black	1	26	?	?
KOBASHIGAWA	1969	X	-	-	-	X	X	-	X	X	X	X	X	-	-	-	-	-	-	-	-	-	?	A-A/A-C;Black	1	26	?	?
PFUDERER	1969	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		3	24-36	FP	H
BLOUNT	1972	X	X	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Culture;(Kenya	2	30	FP C	H
BROEN	1972	X	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	?	A-A/A-C;Age; Situation	10	18-26 4-6 yr	FP ST	L
FRIEDLANDER	1972	X	-	-	-	-	X	-	X	-	-	-	-	X	-	X	-	X	-	-	-	-	X	M-C/F-C	2	12	FP	H
SACH et al	1972	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Non-Parent; 1 Child	5	27	S	L
SNOW	1972	X	-	-	-	X	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	3	A-A/A-C;Age; Task Difficulty		9-12yr	S	
																								Mother/Non-Mother;Child Presence	16	2-3yr	ST	L
NELSON	1973	X	-	-	-	X	X	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	?	Maternal Style	18	12-25	FP S	H
OLESSON	1975	X	X	X	X	?	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M-C/F-C	12b	?	?	L
LONGHURST et al	1975	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age	16	1,2,3yr	FP	L
SEITZ & STUART	1975	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	3	-	19	19-24 48-61	FP	L
CHERRY & LEWIS	1976	X	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	?	Sex	38	24	FP	L
FOPP	1976	X	X	-	-	-	-	-	X	-	-	-	-	X	-	-	X	-	-	-	-	-	X	Patterns of Interaction	20	1½-5yr	FP	H
REICHLE	1976	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	X	-	X	X	X	X	Age	24	21-35 36-37	FP	L
SCHUPPER	1976	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	Situation	6	19-23	FP ST	H
SNOW et al	1976	X	X	X	-	X	X	-	X	X	X	-	-	X	X	-	X	-	-	-	-	-	X	Class;Situation Culture (Dutch)	18	14-30	FP ST	L
BLOUNT & PADGUG	1977	-	-	-	X	-	-	-	X	-	-	-	-	X	-	-	X	-	-	-	-	-	X	English/Spanish Individual Data	9	9-31	FP	H
CORSARO	1977	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	X	-	-	-	-	-	X	Age	3	30-42 32-44 4-5 yr	FP	L M
CROSS	1977	X	X	X	-	X	X	X	X	X	X	X	X	X	-	-	X	-	-	X	-	-	X	Age;Language Level	16	19-33	FP	H
HAPPTESS	1977	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Culture(Kenya)	8	24-32	FP	H
NEWPORT et al	1977	X	X	X	-	X	X	X	X	-	-	-	-	-	-	-	X	-	-	-	-	-	X	A-A/A-C;Age Language Level	15½	11-14 19-25	FP I	H
RIEGLER	1977	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A-S/A-C;Age; Black;Working Class	10	10-22 13-25	S I	L
FOLGER & CHAPPELL	1978	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	X	Parental Style	6	14-25	FP	H
MITTS	1978	-	-	-	-	-	-	-	X	-	-	-	-	X	X	X	X	-	-	X	-	-	X	Age;Sex Language Level	18	12-16-20	FP	L
MORGAN	1978	X	X	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Language Level	16	15-19	FP	H
LIEVEN	1978	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	X	Age;Language Level	3	17-24 18-25 19-26	FP	H
RYAN	1978	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Syntax/ Intonation	10	17	FP	L
SWATZ	1979	X	X	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	24,232?	FP	H
SNOW	1977/78	X	X	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age	2	2-18	FP	H
BELLINGER	1979	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age	40	12,20, 27,69	S	L
FURROW et al	1979	-	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age;Language Level	7	18-27	FP	H
GOLINKOFF & ARES	1979	X	X	X	X	X	X	-	X	-	-	-	-	X	X	X	X	-	-	-	-	-	3	M-C/F-C;Sex Situation	24	??	FP S O	L
CHERRY SCHACTER	1979 1979	X X	X -	- -	- -	- -	- -	- -	- X	- -	- -	- -	- -	X X	- -	- -	- X	- -	- -	- X	- -	- -	X X	Language Level Education, Race; (Black/White)	30	24 22	FP FP	L H
SWATZ	1979	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Language Level	17	18-34	FP	H
BUIM et al	1974	X	X	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Down's Syndrome(DS)/ Normal(N) Situation	11	DS:24 N: 24	FP S	L
PONDAL	1976	X	X	X	X	X	X	-	X	X	-	-	-	X	X	X	X	-	-	-	-	-	X	DS/P	42	DS:3-13yr N:25-37	FP	H
O'REILLY-COLLARD	1978	X	X	X	-	X	X	X	X	X	X	X	X	X	X	-	X	-	-	-	-	-	-	DS/N; Situation	12	DS:22-34 N:16-29	FP S	L
ZWESELPIPT et al	1979	X	X	X	-	X	X	X	X	X	X	X	?	X	X	-	X	-	-	-	-	-	-	DS;Parental Style	7	34-75	FP	H
YAPP et al	1980	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DS;Language Level;Exp/ No Exp	16	6-12	FP C	H

TABLE A3: FUNCTION OF CONVERSATIONAL STRATEGIES AND TOPICS OF CONVERSATION

| RESEARCHERS | REFERENTS (TOPICS) | | | | | | | | FUNCTION OF CONVERSATIONAL STRATEGIES | | | | | | | |

TABLE A4: INDICES OF TURN-TAKING AND MAINTENANCE OF CONVERSATIONS BETWEEN MOTHERS AND CHILDREN

RESEARCHERS	TURN-TAKING														CONTINUITY/COHESIVENESS, BREAKDOWN OF TOPIC																INDEPENDENT VARIABLES				
	CARETAKER								CHILD																									
	Ratio Caretaker/Child Utterances	Total Number Turns	Mean Length Utterances/Turn	Initiating Turns (Percent)	Responds to Child's Verbal Turn	Responds to Child's Non-Verbal Turn	Gives Feedback to Child's Response		Total Number Turns	Mean Length Utterance/Turn	Number Vocalizations/Turn	Initiating Turns: Verbal Vocal Mode	Initiating Turns: Non-Verbal	Responds to Caretaker (Percent)	Simultaneous Turn with Caretaker	Length of Exchange on Topic (in Turns)	Exchanges/Minute	Caretaker Responds with Question	Utterance Types to which Child Responds (Percent)	Child Responds to Caretaker's Question	Contingent/Adequate Response	Percent Child Utterances to which Caretaker Does Not Respond	Percent Inappropriate Child's Response	Child's Non-Response	Caretaker Initiates Repair	Types of Repair Strategies	Child Initiated Repair	Child's Response to Request for Repair	Patterns of Communications	Games, Routines	Specific Variables Examined, or Special Characteristics of Dyad	Sample Size (in Dyads)	Age Range of Children in Months (unless stated in Years)	Situation	Setting
BLOOM et al, 1976	X	-	-	-	-	-	-		-	-	-	X	-	X	-	X	-	-	X	X	X	-	X	-	-	-	-	-	-	-	Language Level	4	21-36	FP	H
CHERRY & LEWIS 1976	-	X	-	-	-	-	-		X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	Sex	36	24	FP	L
*KEENAN & SCHIEFFLIN, 1976	-	-	-	-	-	-	-		-	-	-	X	X	-	-	-	-	-	-	-	X	-	-	X	X	-	-	-	-	1 Pair Twins	3	16-34 11-45	FP	H
*OERR 1976	-	-	-	-	X	-	X		-	-	-	X	-	X	-	X	X	X	X	X	-	-	-	-	X	-	-	X	-	Patterns of Interaction	20	19-30yr	FP	H
BOHANNON et al, 1977	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	20 adults with 1 child	20	32-36	FP	H
CORSARO 1977	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	X	-	-	-	Age;M-C/A-C	3	10-42 32-44 4-5yr	FP	AR
CROSS 1977	X	-	X	-	X	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Age;Language Level	16	19-33	FP	H
*CARVEY 1977	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	C-C		3½-5½yr	-	-
PODGON et al 1978	-	-	-	-	-	-	-		-	-	-	X	-	X	X	-	-	-	X	-	X	X	X	X	-	-	-	-	-		3	22-29 16-24 22-29	FP	L
SCHACTER et al 1977	-	-	-	X	X	X	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TA Teachers; Age	52	17-34 3,4yr	FP	S
SNOW 1977/78	-	-	X	-	-	-	-		-	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	Y	-	Age	29	3-18	FP	H
WELLMAN & LEMPERS 1977	-	-	-	-	-	-	-		-	-	-	X	X	-	-	-	-	-	-	-	Y	-	-	X	-	-	X	-	-	A-C/C-C	10	25-34	FP	S
*BLACK 1978	-	-	-	-	-	-	-		-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	C-C	12	4-5yr	FP	S
*ERVIN-TRIPP 1978	-	-	-	X	-	-	-		-	-	-	-	-	-	-	-	-	-	-	X	X	-	X	-	Y	X	-	X	-	1 Adult; Language Level	5	21-42	S FP	L
HIMES 1978	-	-	-	-	X	-	X		-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	Age;Sex; Language Level	18	12-15-20	FP	L
HORGAN 1978	-	-	-	-	-	-	-		-	-	-	-	-	X	-	-	-	-	X	X	X	-	-	Y	-	-	-	-	-	Language Level	19	15-19	?	?
LIEVEN 1979	-	-	-	-	X	-	-		-	-	-	-	-	X	-	-	-	Y	X	X	-	X	-	-	-	-	-	-	-	A-C/M-C;Age	3	18-25	FP	H
NINIO & PRUNER 1978	-	-	-	X	X	X	X		X	-	-	-	Y	X	-	X	X	X	-	-	-	-	-	-	X	-	-	-	Y	Y	Patterns of Interaction; Age	1	8-16	ST	H
SHATZ 1978	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	X	X	-	-	X	-	-	-	X	-	-	-	2nd Born (1 Girl)	5	19-29	FP	H
*SHIELDS 1979	-	-	-	-	-	-	-		-	-	-	X	-	X	-	X	-	-	-	-	Y	-	-	-	X	-	-	X	Y	-	C-C	7	3-5yr		S
*SHUGAR 1978	-	-	-	-	-	-	-		-	-	-	-	-	X	-	-	X	-	-	-	X	-	-	-	Y	-	-	-	Y	-	A-C	3	19,24	FP	H
CHERRY 1979	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	Language Level	38	24	FP	L
COLNIKOFF et al 1979	-	X	X	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M-C/F-C;Sex; Situation	24	19	FP ST O	L
*McTEAR 1979	-	-	-	-	-	-	-		-	-	-	X	Y	-	-	-	-	-	-	-	-	-	-	-	X	-	X	X	-	-	C-C		2½-4yr	FP	S H
MALZONE & PAPPER 1979	-	-	-	X	-	-	-		-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	Y	-	A-C	19	27-29	FP C	H
SHATZ 1979	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	Language Level	17	18-24	FP	H
SCHACTER, 1979	-	-	-	-	-	X	-		-	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	SES;Race (Black/ White)	30	28	FP	H
*WELLS 1979	-	-	-	X	X	X	X		-	-	-	X	-	X	-	X	-	-	-	-	-	X	-	-	X	X	X	X	X	-	A-C	2	25	FP	H
HOLMBERG, 1980	-	-	-	-	-	-	-		-	-	-	X	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A-C/C-C;Age	72	12,19,24 30,36,42	FP	S
*BROWN, In Press	-	-	-	-	-	-	-		-	-	-	Y	-	-	-	X	-	-	-	-	-	-	X	-	X	-	-	-	Y	-	Language Level	21	30		
KAYE & CHARNEY, In Press	-	-	X	-	-	X	-		-	X	-	-	-	X	X	-	-	X	-	-	-	-	-	-	X	Y	-	-	-	-	Situation	28	26,30, 34	FP	H
JONES 1977	-	-	-	X	-	-	X		-	-	-	-	-	X	X	X	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	Down's Syndrome(DS) Normal (N)	12	DS-12-23 N-3-18	FP	H
CHESELDINE et al 1979	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Parental Style;DS	7	56-75	FP	H
MITCHELL, 1980	-	-	-	Y	-	Y	X		-	-	-	-	-	X	X	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-	Down's Syndrome	8	4½-6yr	S	H

TABLE A5: MATERNAL NON-VERBAL STRATEGIES

RESEARCHERS		PROSODIC FEATURES											HAND, ARM GESTURES						VISUAL GESTURE	INDEPENDENT VARIABLES				
		PITCH			ACOUSTICAL CLARITY					Method of Analysis														
		Median Fundamental Frequency	Range	Direction of Sentence Terminal Intonation	Unintelligible Utterances	Dysfluencies	Word Duration (Vowel, Consonant)	Volume (Whisper)	Stress	Descriptive	Spectogram		Deictics (Pointing)	Pantomimics	Semantic Relational (Adult-Type)	Physical Handling of Child	Handles Toys	Use of Gesture plus Verbalisation	Direction of Mother's Visual Attention (to child, toy, etc.)	Specific Variables Examined, or Special Characteristics of Dyad	Sample Size (Number of Dyads)	Age Range of Children in Months (unless stated otherwise)	Situation	Setting
DRACH	1969	X	X	-	-	-	-	-	-	X	-		-	-	-	-	-	-	-	A-B/A-C; Black	1	26	?	?
BROEN	1972	-	-	-	-	X	-	-	-	-	-		-	-	-	-	-	-	-	A-A/A-C; Age Situation	10	18,26 4-6 yr	FP ST	L
SACHS et al	1972	X	-	-	-	-	-	-	-	X	-		-	-	-	-	-	-	-	Non-Parents-1 Child	5	22	S	L
CLARKE-STEWART	1973	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	X	Age	36	9-18	FP	H
GARNICA	1974	X	X	X	-	-	X	X	X	-	X		-	-	-	-	-	-	-	-	24	2,5 yr	S	L
FRASER et al	1975	-	-	-	-	X	-	-	-	-	-		-	-	-	-	-	-	-	Age; Sex; Situation	32	18,30 4 yr 6 yr	S ST	L
ZEGIOB et al	1975	-	-	-	-	-	-	-	-	-	-		-	-	-	X	X	-	X	Pace; Sex; SES	40	4-6 yr	FP S	L
NEWPORT	1976	-	-	-	X	X	-	-	-	-	-		-	-	-	-	-	-	-	A-A/A-C; Age; Language Level	15 g	12-15 18-21 24-27	FP I	H
PARKER	1976	-	-	-	-	-	-	-	-	-	-		X	X	-	X	X	X	X	Age	3 b	19-21	C	H
REMICK	1976	X	X	-	-	-	-	-	-	-	X		-	-	-	-	-	-	-	A-A/A-C; Age Individual Data	8 g	17-30	FP I	H
BLOUNT et al	1977	X	X	-	-	-	X	X	X	X	-		-	-	-	-	-	-	-	English/Spanish Individual Data	9	9-21	FP	H
CROSS	1978	-	-	-	X	X	-	-	-	-	-		-	-	-	-	-	-	-	Age; Language Level; Australian	16	19-33	FP	H
GARNICA	1978	-	-	-	-	-	-	-	-	-	-		X	X	-	X	-	X	X	Language Level	9	18-30-40	FP	L
HIMES	1978	-	-	-	-	-	-	-	-	-	-		X	-	-	-	-	-	X	Age; Language Level	7	18-27	FP	L
RYAN	1978	-	-	X	-	-	-	-	-	X	X		-	-	-	-	-	-	-	-	10	12	FP	I
BRIDGES	1979	-	-	-	-	-	-	-	-	-	-		X	X	-	-	-	X	X	Language Level	32	2-2½ yr	S	L
GUTMANN et al	1979	-	-	-	-	-	-	-	-	-	-		X	X	X	-	-	-	-	Situation; Age	32	2-3 yr 4-5 yr	ST S	L
RODGON et al	1979	-	-	-	-	-	-	-	-	-	-		X	X	X	-	-	-	-	A-A/A-C; Situation Language Level	24	17-30 42-51	FP S ST	L
FOGAN et al	1969	-	-	-	-	-	-	-	-	-	-		X	-	-	X	X	X	X	Mental Handicap(MH) Non Handicap (N)	16	MH: 1-7 yr N: 4-5 yr	FP	L
FILLEP et al	1976	-	-	-	-	-	-	-	-	-	-		X	X	-	X	X	-	-	MH	21	20-64	S	L
PONDAL	1976	-	-	-	X	X	-	-	-	-	-		-	-	-	-	-	-	-	Downs-Syndrome(DS) Normal (N)	11	DS: 3-12 yr N: 20-32	FP	H
JONES	1977	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	X	X	DS/N	12	DS: 13-23 N: 8-18	FP	H
BUCKNALT, et al	1978	-	-	-	-	-	-	-	-	-	-		-	-	-	X	-	-	X	DS/N; Situation	20	DS: 9-17 N: 9-18	FP S	L
O'KELLY-COLLARD	1978	-	-	-	-	X	-	-	-	-	-		-	-	-	-	-	-	-	DS/N; Situation	20	DS: 22,54 N: 15-20	FP S	L
VIETZE, et al	1978	-	-	-	-	-	-	-	-	-	-		-	-	-	X	-	X	X	Developmental Delay (DD)/ Normal	76	DD: 13-29 N: 9-12	FP	H
MITCHELL	1980	-	-	-	-	-	-	-	-	-	-		X	X	-	X	X	-	-	DS; M-C/F-C	8	4½-6 yr	S	L

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